FOODS

PREPARATION AND SERVING

Pearl A. Bailey

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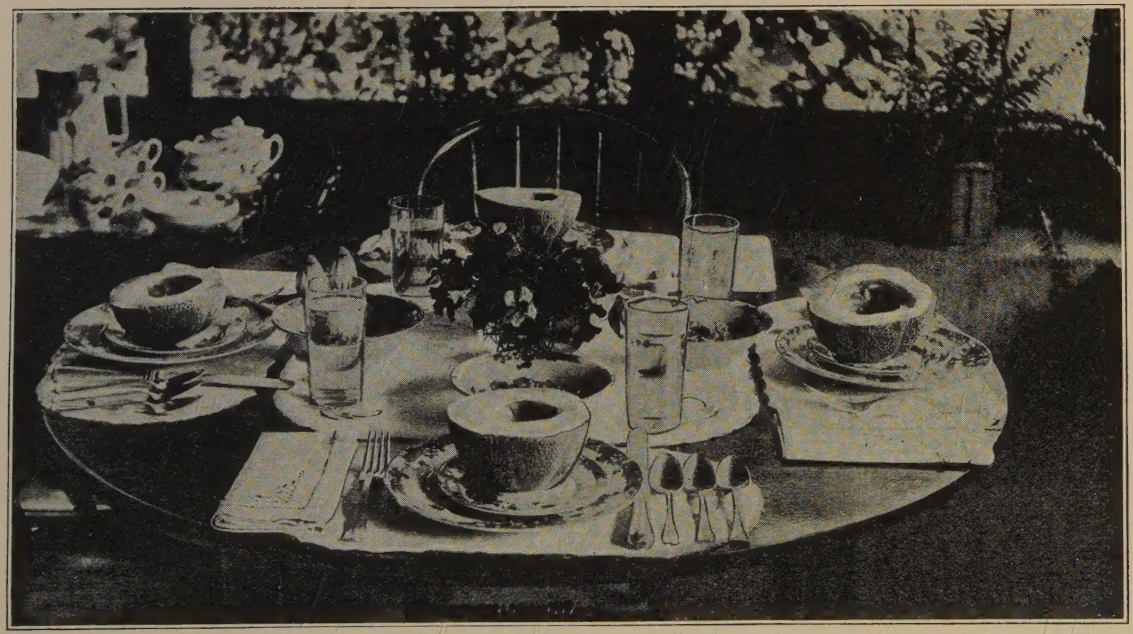

Breakfast on the porch. See Lesson 12.

FOODS

PREPARATION
AND
SERVING

BY
PEARL L. BAILEY

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PREFACE

Never before has the world so fully realized the tremendous importance of the use of the right foods in the diet as at the present time.

The study of foods, their preparation and the correct way of serving them is now universally regarded a vital part of the home-making training of girls. Many important discoveries in nutrition, however, together with a natural development of the subject have brought about changes in the manner of teaching it. Topics of most modern emphasis are, therefore, included and treated accordingly in a way that has been found most practical.

A course in foods must be presented in a simple logical manner and include the reasons for doing, how to do, and plenty of practice in the doing. The basis of scientific food preparation is in knowing the underlying principles and the reasons for doing things.

In preparing a two-years' course of study in Foods, Preparation and Serving, which will be adaptable to all conditions it is the aim to give the reasons for doing things in a simple, easily comprehended way; to give direct, complete instructions in the methods of manipulation of materials and processes; and to give ample opportunity for applying this knowledge through the serving of meals at school and at home. The Home Project suggestions are a continuation of this application. The Experiments are impressive and within the range of the pupil.

The sequence of foods is presented in a natural order. Single foods suitable for the simple meal of breakfast or supper are considered first with a gradual introduction to more complex foods and cooking processes that go to the formation of luncheons and dinners which follow. No one outline of study would ever be usable under all conditions without some modification and no two instructors would be

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apt to present the subject in an identical manner even with the same conditions. The course as here presented is the outcome of close observation of conditions and methods and a constant demand for a course which is readily adaptable to all conditions.

The subject matter is arranged by lessons to accommodate classes having one lesson a week. Where more than that time is given ample application is made to allow for the practical laboratory work, and the subject matter may be easily supplemented by outside assignments and reading. The length of the class period frequently requires considerable planning to get all the work into the lesson time. Cooking processes must be begun in many cases before the food work is discussed. Students are always more interested in the actual doing and when the laboratory work precedes the recitation, they learn to think for themselves better and are far more interested in the entire subject.

The recipes included in the applications are thoroughly reliable and have been adapted to school cookery. They are of family size and are easily divided for class work. Students should be required to make their own divisions of the recipes. Self-reliance is necessary if the home work is to be successful. It is not necessary for girls to memorize recipes. Only general proportions and a few standard rules need to be known. With the average thinking girl of to-day the standard rule and how to vary it are sufficient equipment for emergency needs and far better than a lot of memorized recipes which are too often forgotten.

The meal serving should always be within the possibilities of the average home represented by the class. Elaborate service and menus under most conditions are to be avoided. Simple table service without a maid should be emphasized.

The cost of food and the proper way of serving it should be included in each lesson on a new food.

Frequently demonstrations by the instructor of various

processes such as kneading of bread, fitting pastry to the tin or the folding of an omelet are helpful and should precede the class work. Topic assignments to one or more on the subject of fuels, cooking stoves, ranges, fireless cookers, etc., and the making of charts from illustrations of these create a live interest in the subjects. Girls must gather this material from various sources outside the classroom, thus saving valuable time for more important things in the class time. For this reason these topics have been omitted in this text, only the care of equipment being thought necessary for reference when needed. Illustrations of many very familiar things have been omitted also.

In many districts girls must take the place of mother when she is away for the day and it is quite essential that sufficient infant and child feedings be given to enable these "little mothers" to prepare the food in the right way for the smaller brothers and sisters. Child-feeding has become a subject of first importance. It is highly desirable that more knowledge on this subject should be acquired in food study by those who will be responsible for its application. It is also quite essential that simple work in the feeding of the sick and kinds of diets be given to girls so that they may be able to carry out a physician's orders and follow instructions when illness occurs in the home. More complete courses in this may be given later in another course of foods.

Marketing trips in connection with the meal planning and serving are essential and all trips to commercial industries, flour mills, canneries, dairies, etc., make a course full of interest and add materially to its future usefulness.

Projects for home work are suggested after each lesson. The application and required records may be decided by the teacher, thus enabling her to adapt the project to different home conditions and affording opportunity for variation each year.

Pearl L. Bailey

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BULLETINS

List of bulletins relating to food may be obtained of the U. S. Department of Agriculture, Washington, D. C. State Agricultural Colleges also have bulletins which may be had for asking.

FOODS

Preparation and Serving

PART ONE

PRELIMINARY WORK

HOUSEKEEPING

Certain housekeeping duties are necessary in all homes and school kitchens. Supplies are to be taken care of when delivered, cupboards to be kept in order, ice box and sinks to be cleaned, floors to be swept, towels rinsed, stoves brushed, in addition to the prosaic work of dishwashing. All these processes become a part of the day's routine if they are carried on in a systematic manner and the whole business of housework may be made very interesting. There is no excuse for "running short" or "being out" of supplies, if a little planning and common sense are used. It is just as easy, for example, to buy sugar or salt the day before the can is empty as it is to wait until some is needed for dinner. Constant borrowing or "sending to the store" at the last minute is admitting lack of system in household management. No business can be successful without system.

In school kitchens the general housekeeping duties may be assumed by two girls appointed each week. These may be numbered One and Two and have definite duties assigned to them. These duties are usually enough to keep housekeepers occupied during the laboratory period and they may be excused from the regular class work. Where girls prepare small portions in class work for themselves permission may be given to two girls as special favor to prepare double portion and serve to the housekeepers.

Housekeeper duties should include the following directions:

1. Bring out supplies to table.
2. Pass any dishes or supplies that are needed.
3. Attend to lighting large ovens, if they are to be used.
4. See that pantry is in order and shelves cleaned.
5. Remove supplies from sacks when delivered and put in plainly labeled jars.
6. Keep ice box clean and in order.
7. See that use of all food is made and that no left-overs are allowed to spoil.
8. Make report each lesson on the growing shortage of any food so that the instructor may have this information in making her order sheets.
9. Act as helpers where special service is needed.
10. Look after towel supply and laundry.
11. Clean sinks, stoves, and floor.
12. Put away supplies at close of lesson.
13. Leave kitchen in order, curtains even, and all duties finished.

Note. Special duties for Housekeepers 1 and 2 fitting each school plan should be typed and mounted in every kitchen where they may be referred to easily.

HELPS FOR GENERAL CARE OF EQUIPMENT

Care of the Pantry.—Closed cupboards are much better than open shelves, but are not always available.

Cover the pantry shelves with oilcloth. Tack it down firmly over the edges of the shelves. Oilcloth is easily wiped, and is durable material. Plain white paper may be used if oilcloth is too expensive. Renew the paper frequently.

Put like dishes together. Keep all spices and staple things together.

Keep food supplies in covered jars properly labeled.

Never arrange supplies in more than two rows, thus saving time and preventing confusion.

Prepare bread crumbs from all dry pieces of bread; roll and sift and keep in covered jars ready for use.

Watch canned goods and jellies and report any that appear to be spoiling.

Care of the Table.—When the dishes are all washed, clean the table by scrubbing with a brush dipped in hot water and then in Dutch cleanser or in scouring soap. Use little water; scrub thoroughly with the grain of the wood. Rinse well and wipe dry as possible with a cloth wrung out of clear water.

See that the edges of the table are kept clean and dry.

Clean under the individual stoves thoroughly.

Ammonia or borax will remove grease spots. Spread on the spots and let stand a few minutes; then rinse with cold water. Hot water softens grease and drives it into the wood.

Care of Floors.—For sweeping floors, a good even broom or a long-handled soft brush is best.

Use little or no water on hardwood floors. Brush dry. Sweep from the outside of the room towards the center; be sure corners and baseboards are well dusted.

Make short strokes of brush or broom, and keep it close to the floor to prevent raising a dust. Gather dust into a small spot and take up with brush and dustpan; burn, if possible, at once. A little oil on the brush collects the dust together better.

Care of Brooms and Brushes.—*Brooms.*—In using a broom alternate the sides, so that it wears evenly. Clean broom after sweeping, making it ready for use again. Always hang it up; do not allow it to rest on the bristles. The broom should be washed in warm suds every week to keep it in good condition.

Brushes.—Brushes should be cleaned well after each using. Later they may be washed in cold water, but great care must be taken not to wet the glue which fastens the back of the brush. Dry thoroughly.

Care of the Ice Box.—Keep the ice box perfectly clean. See that the waste from the ice is properly carried off. It should drain into an open end of a trapped drain-pipe. See that the trap is open and works correctly. Keep a brush for cleaning out the trap. Scald out the ice box and trap once each week with hot soda or borax water.

Wipe the ice box dry, and always wipe the shelves as soon as anything is spilled over them.

Do not put hot food nor food with strong odors into the ice box. Keep milk bottles covered and keep the milk and butter in the lower part of the box, for they absorb odors readily. Do not put unnecessary dishes into the ice box. Set the food away in clean dishes, and in as small dishes as possible.

Do not put things on the top of the ice box. They look untidy.

Care of the Sink.—Sinks with open plumbing are best; but even the best need constant care. In selecting sinks, avoid those with wood around them. Good porcelain sinks, with rim and drain board of the same, are the best and the easiest to keep clean.

The trap below the sink should be deep enough to retain sufficient water to form a seal which prevents the passage of poisonous gases back through the pipe into the room. If the pipe and trap become clogged with foreign matter like lint, hair, or grease, it breaks the water seal. It is very important that nothing but water is allowed to go into the sink and drain pipe.

Keep a sink strainer in the sink and pour all waste liquids through it. Do not put garbage into the sink strainer; put it into the garbage can. Sink strainers are for liquids only. When through work, empty the strainer, wash in hot soapsuds, wipe dry, and hang up.

Once each week pour a strong solution of sal soda (about ½ cup soda to 2 quarts water) down the pipes. Flush the

sinks frequently with plenty of hot soapsuds and boiling water. When through work, always leave the sinks perfectly clean. Wash them with hot water and remove any stains or grease. Rinse well and wipe dry. Kerosene cuts any grease readily. Rinse well after using. Avoid the use of any scouring soap, which destroys the luster of the enamel.

When houses are closed for the summer and plumbing is not used for some time the water may evaporate from the trap and poisonous gases from the sewer cause serious illness in the family upon their return to the house. To prevent the evaporation of the water in the trap pour sufficient oil in the pipe to cover the top of the water.

Care of the Garbage Can.—The can must be kept perfectly fresh. Scald and scrub out the can thoroughly each week, and set it in the sun and open air. Keep it covered when garbage is in it. Place a clean newspaper in the bottom of the can. This is easily removed and all the contents burned, buried, or carried away. Put only solid materials in the can. Liquids must first be drained off.

General Care of Cooking Devices.—There are many means of producing the necessary heat for cooking purposes, but the general care of all is very much the same.

When fuel such as wood, coal, gas or oil are used for heating purposes, oxygen is also necessary before combustion can take place and a good fire burns. It is necessary that all air passages in stoves and ranges be kept clean and are properly adjusted so that the right amount of air and oxygen is available for a good clear fire.

Care of Wood and Coal Ranges.—Clinkers, egg shells, etc., should be avoided in the fire box. Put shells in only when the fire is burning freely.

Do not allow fuel to reach the top of box. It reddens the covers and causes them to warp.

Empty the ash pan regularly and do not let it over-

flow. An overflowing ash pan hinders the draft of air as well as makes extra work.

Keep the stove clean. Brush off at once anything that is spilled over it or in the oven.

A cloth with a few drops of kerosene on it rubbed over the stove when cold will keep it from rusting and is sufficient to keep the stove in good condition.

If a polish is preferred, select one of good quality, moisten a small quantity with water, and apply sparingly with a brush, just as the stove is warming up.

Keep the chimney and oven flues free from fine ashes. These prevent free circulation and absorb heat, if allowed to become thick.

Care of Gas Stoves and Ranges.—Keep air holes clean.

Wipe the large tray under top burners clean when through cooking each day. Remove and wipe under it often.

If anything is spilled on the stove, wipe it off immediately.

Rub daily with cloth containing a few drops of kerosene, to keep black and clean and free from rust.

Care in Lighting and Using Gas Burners.—Light the match, open the cock of the burner you wish to light, and apply match to burner. If it "fires back," close gas cock, and open again to permit the flow of gas through the cock for a moment to drive out the air.

Each burner has an air regulator, which should be adjusted to the air pressure in the city where it is used. The flame should burn blue; if the flame is yellow, adjust air flow at once.

Caution: In discontinuing use, always see that all stopcocks are shut off tight.

As soon as a kettle boils, turn down the gas enough just to keep contents boiling. If the gas is turned too high, the yellow flame will blacken the kettle. A blue flame is clean. Use simmerer instead of a large burner, when long, slow cooking is needed or to hold warmth.

Care in Lighting and Using the Gas Oven.—Open the oven doors. If there is a pilot-light, turn on the pilot and apply lighted match through hole for that purpose in the side of the oven. When lighted, turn on first one gas cock in the oven and then the other.

See that the entire coil burns with a blue flame.

If a direct action, apply lighted match directly to the coil as cock is turned on, always with oven doors open. Explosions may occur if one fails to observe these directions.

In heating the oven, light gas a few minutes before the dish is ready to go in, to insure heat; then reduce the flame to hold the heat. Turn off the gas entirely a few minutes before removing baking from oven, since the oven retains enough heat to finish the cooking, and the extra gas would be a waste.

The care of electric stoves is more simple than that of either coal or gas ranges since there is no fuel, ashes, or air to require attention.

Keep the surface clean. Give care as for gas range.

See that the electric coil is working properly.

Adjust the electric switch for the right temperature required for the cooking process and avoid having too high a current.

If any coil, or heating element, is not heating properly, call an electrician and have it repaired. It is poor economy to attempt repairs oneself.

Turn on the electric switch for the oven only a few minutes before the oven heat is to be used, since it requires but a few minutes to heat. Test the oven and reduce the amount of the current if the heat is too great.

Care of Electric Appliances.—Toasters and cookers must be kept clean and the cord in perfect condition.

Always turn on the electric current before inserting the end of the cord in the electric appliance. Wear on the heating element is thus saved.

In discontinuing the use of the electric appliance draw out the plug from the toaster, iron or cooker before turning off the switch.

Keep in a dry place, so they will not rust.

Care of Oil Stoves.—Clean wicks and cylinders every day. See that the tank for oil is refilled and never allowed to run dry.

Wipe surface of stove and keep perfectly clean.

Fill oil tanks only when the stove is not in use.

In order to get the best flame, see that the oil stove is not in a draft, which interferes with the burners.

Care of Fireless Cookers.—Keep all parts clean and dry.

Keep cooker tightly fastened when in use.

Air out frequently to keep sweet and clean.

Keep radiators in a dry place and heat them very gradually in order to prevent breaking.

Always wipe the compartment and remove the radiator as soon as the cooker is opened and the kettle is removed.

Care of Pressure Cookers.—Clean thoroughly and dry after each using.

Let stand open a few hours before closing and putting away.

Make sure everything is ready to use again with a few minutes preparation.

Store in a clean dry place.

RULES FOR WASHING DISHES AND FOR CARE OF UTENSILS

Preparations.—1. Collect all dishes to be washed; scrape, clean, and pile similar dishes together.

2. Soak dishes that have contained dough, batter, eggs, or starch in cold water; those soiled by sugar, in hot water.

3. Wipe out all greasy pans with paper and put paper in the garbage can or stove.

4. Remove the hot-plate board from the table and place on the stove, providing a clean, dry place clear for clean dishes.

5. Serviceable towels for drying dishes may be made by hemming flour sacks. Glass toweling or linen crash absorbs moisture readily. A good dishcloth should not be too large and should be sweet and clean. Have one for china and one for kitchen dishes.

Instructions for Washing.—1. Fill the dishpan one half full of good water, and change the water occasionally if there are many dishes.

2. Put glasses into hot water sidewise to prevent uneven expansion of glass, which breaks them.

3. Glass and silverware are brighter if wiped directly from clean, hot suds. Do not rinse.

4. Wash cut glass in warm water and dry carefully. A sudden change of temperature breaks cut glass.

5. Rinse all dishes, except glasses, in clean, hot water, and wipe quickly with a clean dry towel.

6. Do not put bone or wooden knife or fork handles in water. Wipe with a wet cloth and then dry them.

7. Scour kitchen knives and forks with bath brick or sapolio and then wash and rinse well.

8. Scrape rolling-pin and molding board and wipe with a wet cloth. Do not use much water on either.

9. Wash the teapot and coffeepot with clean hot water. Wipe dry, clean spout thoroughly and leave the cover open. Never wash them with soapy water.

10. Remove stains from tin or enameled ware with scouring soap.

11. Clean aluminum ware with steel wool.

12. Wash the dishpan, rinse, and wipe dry.

13. Rinse the dish towels and hang in the sun and air to dry.

RULES FOR WORKING

1. Wash your hands with soap and water and scrub and clean your nails. If you handle anything not clean, wash your hands again.

2. Have your hair neatly fastened back.
3. Wear no jewelry.
4. Wear a wash dress, if available.
5. Never dry dishes with a hand towel or an apron.
6. Never taste with the mixing spoon.
7. Have gas or oven ready for use when needed.
8. Have all necessary material and utensils at hand, with a utility plate on which to lay sticky knives, etc.
9. Economize in the use of dishes by measuring dry material first, then liquid, and lastly fats.
10. Break eggs separately into a cup or a saucer before putting into the mixing bowl, to see that they are fresh.
11. Save a little milk to rinse the bowl in which the eggs are beaten.
12. Tin dishes and iron spoons will discolor batters; so use earthen dishes and wooden spoons.
13. Do not let vinegar or lemon juice stand in a tin cup or dish.
14. Clean up your work and put egg and batter dishes to soak as soon as empty.
15. Stand egg beaters in cold water, but take care not to wet the cogs.
16. Stir and beat with a tablespoon or mixing spoon, never with a teaspoon.
17. Hang a piece of paper on the oven door when the oven is in use, to remind you of the baking.

TABLE OF ABBREVIATIONS

For the sake of convenience in cookery, a few abbreviations are used. Those used throughout this text are:

tsp. for teaspoonful	qt. for quart	r. for rounded
tbsp. for tablespoonful	gal. for gallon	hp. for heaping
ssp. for salt spoonful	lb. for pound	sc. for scant
c. for cupful	oz. for ounce	min. for minute
pt. for pint	f. g. for few grains	hr. for hour

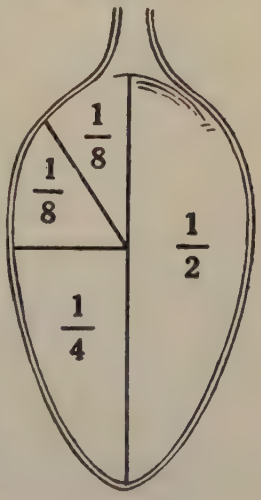
TABLE OF MEASURES

3 tsp. are equivalent to 1 tbsp.
12 tbsp. are equivalent to 1 cup wet material
16 tbsp. are equivalent to 1 cup dry material
2 c. are equivalent to 1 pt.
2 pt. are equivalent to 1 qt.
4 qts. are equivalent to 1 gal.
8 qt. are equivalent to 1 peck, (dry)
4 c. (about) flour equal 1 lb.
2 c. sugar (gran.) equal 1 lb.
2 c. butter packed solid equal 1 lb.
2 c. chopped meat equal 1 lb.
2 tbsp. butter equal 1 oz.
1 tbsp. sugar equals 1 oz.
1 tbsp. liquid equals ½ oz.
9 or 10 eggs, depending on size, equal 1 lb.
The juice of 1 lemon equals 3 tbsp.

All measurements used in this book are *level.*

Directions for measuring must be observed carefully.

The diagram at the right indicates the manner of making accurate divisions of the spoonful. Great care must be taken to measure accurately. Whether the quantities are exact or not often makes a difference.



1. For a *cupful,* fill the cup with the aid of a spoon, and level with a spatula.

2. For a *spoonful,* dip the spoon into the material, lift it, and level true with a spatula.

3. For a *half spoonful,* level a spoonful and then divide lengthwise through the middle.

4. For *one fourth spoonful,* divide the half spoonful crosswise, dividing a little back of the middle.

5. For *one eighth spoonful*, divide a fourth of a spoonful diagonally across from center of spoon to outer rim.

6. In measuring *dry material*, as flour, baking powder, soda, powdered sugar, spices, sift or shake up lightly before measuring. Dipping the cup into the material packs it. Fill with a spoon.

7. To measure *butter* or *lard*, pack solidly into cup with a spoon.

QUESTIONS AND PROBLEMS

1. What kind of stoves are you familiar with?
2. Can you name any other housekeeping tasks not included in the list of housekeeper's duties?
3. How many teaspoonfuls are in one tablespoon?
4. How many tablespoonfuls are in one cup?
5. Is there any difference in measuring flour when a cup is dipped into the flour or filled with a spoon?
6. Why should measures be level?

APPLICATION

1. Prepare baked apples (lesson 1) or
   Prepare cocoa (lesson 9).

Some simple food preparation adds interest to the preliminary lesson and girls become familiar with the kitchen and equipment.

2. Note the place for everything.
3. Learn to start fire with the cooking appliances used in school kitchen.
4. Practice measuring both liquids and dry materials.
5. Wash dishes in the desks and get everything ready for future work.

HOME PROJECTS

1. Have mother show you the arrangement of her kitchen equipment so that in your work there you will keep it in order.
2. Practice starting fire in your home kitchen.
3. See whether you have a "standard" measuring cup. If not, what measure is used for one half pint in the home kitchen?

LESSON 1

FRESH FRUITS

Fruits.—Fruit is generally defined as being the seed vessels of plants. All seed vessels, however, are not classed with fruit, as in the case of tomatoes and cucumbers. Rhubarb is termed a fruit although it does not contain seeds,—so we have a few exceptions to our definition of fruits.

Kinds.—There are many kinds of fruit, which, either on account of their seasonableness or transportation or cold storage facilities, are available at nearly all times of the year. The most commonly used fresh fruits are apples, bananas, oranges, grapefruit, and lemons. Other fresh fruits are peaches, pears, plums, cherries, grapes, pineapples, and berries, depending on the season of the year.

COMPOSITION OF FRUIT

Fruit	Protein per cent	Carbohydrate per cent	Fat per cent	Cellulose (crude fiber) per cent	Mineral matter per cent	Water per cent
Apples	.4	13.	.5	1.2	.3	84.6
Apricots	1.1	13.4	—	—	.5	85.
Bananas	1.3	21.	.6	1.	.8	75.3
Blackberries	1.3	8.4	1.	2.5	.5	86.3
Cherries	1.	16.5	.8	.2	.6	80.9
Cranberries	.4	8.4	.6	1.4	1.5	88.9
Currants	1.5	12.8	—	—	.7	85.
Grapes	1.3	14.9	1.6	4.3	.5	77.4
Oranges	.8	11.6	.2	—	.5	86.9
Peaches	.7	5.8	.1	3.6	.4	89.4
Pears	1.	15.7	.5	1.5	.4	80.9
Pineapples	.4	9.3	.3	.4	.3	89.3
Plums	1.	20.1	—	—	.5	78.3
Black raspberries	1.7	12.6	1.	—	.6	84.1
Red raspberries	1.	9.7	—	2.9	.6	85.8
Strawberries	1.	6.	.6	1.4	.6	90.4

Composition.—Fresh fruits contain water (from 75% to 95%), sugar, cellulose, fruit acids, mineral salts and vitamines. When ripe, few fruits contain starch; for the ripening process changes the starch in fruits to sugar and gums. Thus the

sour flavor of green fruits becoming sweeter as the fruit ripens. The gum-like substance in fruit is *pectin*, which is the substance that causes jellies to thicken.

Fruits of different kinds vary greatly in composition, some being composed mainly of water and flavors; others contain a large amount of sugar. For this reason we may group fruits into two general classes: (1) Flavor fruits and (2) Food fruits. All fruit, however, is of value as food. The flavor of fruit is due to the presence of mineral salts and fruit acids together with some sugar and certain ethers and oils.

Examples of fruits in the class of Flavor fruits are oranges, lemons, strawberries, pineapples.

Examples of fruits in the class of Food fruits are bananas, pears, peaches, grapes. These contain a large amount of sugar.

All fresh fruits contain vitamine B and vitamine C. Oranges and lemons contain it in the largest amounts, while apples, grapes, and berries in smaller amounts.

VITAMINE VALUES OF FRUITS

Vitamine A	Vitamine B		Vitamine C	
Poor	**Poor**	**Poor**	**Poor**	**Good**
Apples	Apples	Pears	Prunes	Grapefruit
Bananas	Bananas	Pineapples	Grapes	Pineapple
Grapefruit	Blackberries	Plums	**Fair**	**Excellent**
Grapes	Cherries	Prunes	Apples	Lemons
Lemons	Cranberries	Strawberries	Bananas	Oranges
Oranges	Currants	**Good**	Pears	Raspberries
Raspberries	Grapes	Grapefruit		
	Limes	Lemons		
	Peaches	Oranges		
		Raisins		

Food Value.—Fresh fruit is absolutely essential in the diet if good health is to be maintained. It should be eaten at least once every day, the best time being in the morning at breakfast when the appetite needs coaxing. It may be served as a dessert in the heavier meal of the day, if one of the

flavor fruits is used. Food fruits used as a dessert are best with less heavy meals or those lacking in sugar. When used with a meal already rich in sugar, the body is taxed with more than it can use, and so digestion is hindered. Bananas contain much starch and are very indigestible. As they ripen the skins turn dark and the starch is largely changed to sugar. They become more digestible, but not enough so that many can be eaten at one time without causing trouble.

The large amount of water which some fruits contain does not make them of much value to us as an energy-giving or building food; but, inasmuch as the body requires a large amount of water, they afford one way of obtaining it. They have other qualities, however, which render them essential.

Fruits are valuable as foods since they furnish us with mineral salts (sodium, calcium, and phosphorus) that act as body regulators, help to purify the blood, and create an appetite for other food. The mineral salts and acids in some kinds of fruits have a laxative effect, while others act in the opposite manner. Orange juice and rhubarb sauce have laxative properties, while blackberries have a contrary effect.

The fiber present in fruit is the cellulose. This does not add to the food value, but does add needed bulk to the food mass. Cooking helps to soften the cellulose and makes some food more digestible. Flavor fruits are more digestible than the food fruits, since they contain so much water and not so much sugar. Strawberries are an exception. Many persons find that strawberries produce indigestion and, where used frequently during their season, a rash appears and canker sores develop in the mouth.

The vitamine in fruit is of great importance in the diet. In countries where the people live largely on salt and dried fish and during times of war when armies existed mainly upon dried foods a disease called scurvy causing many deaths and much suffering used to be common. Crews of sailing vessels of former days were almost sure to suffer when on long

sea trips. Scientists now know that these diseases were caused by the lack of fresh fruit and vegetables in the diet. Since governments have provided ways of supplying these to their people and to their armies, this disease is disappearing. The substance in fruit and vegetables which prevents the occurrence of this disease is vitamine.

Orange juice being rich in vitamine is now added to the diet of the infant as early as the fifth and sixth months and is considered necessary to the development of the growing child.

Green fruit is harmful to eat, since the fiber is very hard and impossible to digest and the acids make it unpalatable.

Overripe fruit is harmful to eat, since it contains bacteria of many kinds which produce fermentation and disease.

General rules for serving and eating fruit:—

1. Serve some fresh fruit each day.
2. Use only sound, ripe fruit. Unripe fruit is not digestible, unless cooked, and overripe fruit is of inferior flavor and is likely to interfere with digestion.
3. Fruit from street venders should not be used, as it is nearly always too ripe and unclean.
4. Do not eat acid fruits with milk or cream.
5. Cook overripe fruit to make it safe for use.
6. Use sweet fruits, as dates and figs, with cereals, since they supply the necessary sugar.
7. Do not swallow the tough skins of fruits or the seeds of such fruit as the grape and apple.
8. Serve fruits cold.
9. Serve fruits in season. They are more economical.

Care of Fruit.—Remove fruit from sacks upon delivery and keep it in a cool place uncovered.

Change position of fruit occasionally, as decomposition begins earlier where fruit presses together.

Wash or wipe all fruit when it comes from the market. Rinse berries quickly and drain.

Do not soak fruit, as soaking destroys its flavor.

Pare peaches just before serving, for they discolor quickly, and they are not so attractive then.

Cooking Fruit.—Fruit is usually either baked or stewed.

Baking.—Large, watery, whole fruit, as peaches, apples, or pears may be baked.

Stewing—Small fruits, large fruits cut in pieces, and berries are stewed. Cook fruits in enameled granite cooking dishes, since the fruit acids act upon metal vessels, forming harmful substances. Cook fruits at a simmering temperature in covered vessels in order to better preserve their shape.

When to Add Sugar.—Fruits should be cooked tender in enough water to cover before adding the sugar. Add the sugar the last few minutes of cooking and cook further just long enough to thoroughly dissolve the sugar and blend it with the fruit juices. All berries are brighter in color, have a more natural flavor and a clearer juice when cooked in this way. Less sugar is required and there is less danger of burning. Sirup mixtures scorch easily.

If food is cooked with sugar, allow one half cup of sugar to each pint of fruit, add enough water to cover fruit, and cook slowly until tender. Cooking in a sirup keeps whole fruits whole.

In baking fruit the sugar is added before the fruit is put in the oven. Raisins, dates, and figs added to the center of large baked fruits give variety and take the place of some sugar.

Cooking whole fruits in a sirup (made by boiling equal parts of sugar and water together four or five minutes) makes a rich preserve or glacéd fruit. Quinces, crabapples, pears, and peaches are nicely preserved in this way and used in place of jelly for lunch.

Preparation of Fruits for Cooking.—Wash all fruits before cooking. Leave berries whole. Apples should be pared, if peels are tough. Peaches are always peeled. Large fruits may be cooked whole or cut in pieces. Apple sauce may be

strained after cooking in which case the apples need not be peeled. Always use enough water to cover the fruit in cooking unless the fruit contains a great deal of water, as in the case of rhubarb.

Serving Fruits.—Either fresh or canned fruit may be used for breakfast, lunch, or dinner.

Oranges may be served in the shell by cutting into halves crosswise or by cutting a small slice off the top and served with a spoon. If peeled, they may be divided into sections or the whole orange sliced crosswise in thin slices and arranged overlapping on individual plates for serving.

Grapefruit is prepared several hours before serving time. Always remove all the white portion which is bitter and add sugar several hours before serving to bring out the flavor. Serve in half shells or remove the sections from the peel and serve in tall sherbet glasses.

Equal parts of orange and grapefruit cut in half-inch cubes or oranges and pineapple make pleasing changes in ways of serving.

Cantaloupes are served thoroughly chilled, cut in halves and with a small piece of ice in each half.

Fresh strawberries may be served, stemed and washed, with cream and sugar. Large choice berries may be served, with the stems on, with powdered sugar, and eaten from the stems.

Most berries are best served in individual dishes from the kitchen.

Bananas should not be sliced long before serving, as they will lose freshness and become discolored if they are allowed to stand exposed to the air.

Fresh pineapple is pared and cut in cubes and the sugar added several hours before serving time.

Apples, pears, and plums are served whole and prepared by each one at the table.

Berries are served in individual dishes from the kitchen

or served by the hostess at the table. Cream and sugar are added by each one, if desired.

Canned fruit is served by the hostess from serving dish to small dishes at the table.

QUESTIONS AND PROBLEMS

1. What makes overripe fruit unsafe to eat?
2. Why should fruit be thoroughly washed?
3. What makes peaches discolor after being peeled?

APPLICATION

1. Apple Sauce

6 tart apples — Small piece lemon rind
1 c. water — 6 cloves (if desired)
1 c. sugar

Method 1.—Wipe, core, peel, and quarter or slice the apples. Put them with the water in a saucepan and cook until the apples begin to soften. The time will depend upon the kind of apples used. Add the sugar the last few minutes of cooking, then the lemon rind, and if the cloves are used add them. When the sugar is dissolved and the juice is slightly thickened, remove from the fire and cool. Take the lemon and cloves out when cooking is finished.

If apples cook up a great deal, they may be put through a strainer or vegetable press.

(*Each two use* 1 *apple.*)

Method 2.—Prepare the apples as in Method 1. Some apples may be cooked with the peel. Put the water, sugar, and lemon rind into a saucepan and cook 4 or 5 minutes; then add the apples. Cook until tender, being careful not to mash the apples much; remove the lemon peel and cloves and serve cold.

2. Cranberry Sauce

1 pt. cranberries — 1 c. sugar
2 c. water

Method.—Pick over and wash the cranberries. Put into the saucepan with the water and cook about 10 minutes; then add the sugar the last few minutes of cooking. Cranberries cooked without the sugar, and uncovered, retain their color and make a clearer sauce.

(*Each two use* ¼ *rule.*)

3. Stewed Rhubarb

To each cup of rhubarb use ½ c. of sugar.

Method.—Young tender rhubarb may be cooked without peeling;

but, when the peeling is tough, it should be taken off. Cut rhubarb into inch pieces. Put in saucepan with just enough water to cover bottom of pan. Cook slowly, stirring occasionally, about 10 minutes. Add sugar and cook a few minutes longer.

4. Baked Apples

Method.—Pare and core good, uniform apples. Put into a baking pan, fill the center of each apple with sugar, and add a bit of butter on the top. Add enough water to cover the bottom of the pan. Cinnamon or nutmeg may be sprinkled on top, if desired. Bake in a hot oven until soft; baste with the juice in the pan.

The center of apples may be filled with raisins or cooked cereal just before serving to add variety.

HOME PROJECTS

1. Compile a list of fruits according to season which are available in your local market.
2. Ascertain fair price for best quality.
3. Cook apple sauce at home according to Method I.
4. Make list of fruit included in your meals during past week.

LESSON 2

DRIED FRUITS

Common dried fruits are prunes (dried plums), raisins (dried grapes), figs, dates, apricots, currants, peaches, and apples.

Dried fruits are sold in packages or by bulk and are obtainable the year round. They are preserved by drying or evaporating all the moisture out of them. The process is called "dehydrating." This loss of water accounts for their wrinkled appearance.

Composition.—Dried fruits vary in composition from fresh fruits chiefly in the decrease in water and by the proportionate increase in sugar.

Mineral salts and cellulose are present in dried fruits in the same proportion as in fresh fruits.

Vitamine while present is not as effective as in fresh fruits.

Food Value.—Dried fruit is more concentrated and consequently more nutritious pound for pound than fresh fruit. Approximately three fourths of the weight of dried fruit is sugar. Sugar gives heat and energy in the body.

Dried fruits when served should be regarded as part of the meal and used as heat and energy food at that time. If served as a dessert in a meal already rich in sugar foods, the body has an oversupply which requires extra attention. Added labor is put on the digestive organs at a time when they are busy with the regular food needs.

The cellulose in dried fruits is hard. Before the fruit can be properly cooked it must be returned as near as possible to its natural state. It must be soaked for many hours in fresh water in order to regain the amount of moisture lost in the drying process.

The mineral salts and acids present serve the same purpose as in fresh fruits. In some dried fruits these have a

laxative effect in the system. Prunes and figs are especially noteworthy for this. Prune juice is given to infants and growing children as an aid in regulating the bowel movement. Dates, raisins, and prunes are good for growing children and are better than sugar in concentrated form. Having a large percentage of sugar, they satisfy the craving for sweets and, being combined with the mineral salts, add more food value to the diet than one would get in all candy. The monotony of flavor in dried fruits make them unpopular with children as a rule. This may be overcome by varying the way of cooking or by cooking in combination with more acid foods, such as apples or rhubarb.

Dates or raisins added to the cereal for breakfast are a pleasing combination and add sugar to the dish. Less sugar should be used when these fruits are added.

Care.—Dried fruit should be purchased and kept as far as possible in sealed or tight containers to guard against the dangers of dust and vermin.

Directions for cooking dried fruits:—

1. Wash dried fruit in several waters to remove all dust and dirt in the crevices.
2. Cover with freshly drawn water and let stand over night or until fruit is soft and plump.
3. Cook slowly at moderate temperature in the water in which it was soaked.
4. When fruit can be easily pierced with a knitting needle it is done.
5. Add sugar and cook only long enough to blend the sugar with the fruit juice.
6. Raisins and currants used in cooking need thorough washing and drying before being added to a mixture. Flour them slightly before adding to a batter mixture to keep them from sticking together.
7. Dates used in puddings or cakes should be stoned and cut into small pieces.

QUESTIONS AND PROBLEMS

1. How many ways of serving prunes are used in your home?
2. Could you eat dates or raisins instead of candy?
3. What does moderate cooking temperature mean?
4. Why is it essential to use some fresh fruit every day?

APPLICATION

1. Stewed Prunes

½ lb. prunes — ⅓ c. sugar
1 qt. water — 2 or 3 slices of lemon

Method.—Wash the prunes thoroughly; put in clean water and let soak over night. Next morning cover and cook slowly in the same water in which they were soaked, till the skins are soft. Add the sugar and the lemon juice when nearly done.

(*Basis for 2 girls, ⅛ rule.*)

2. Stewed Apricots

½ lb. apricots — 1 qt. water
⅓ c. sugar

Method.—Prepare and cook the same as prunes, but omit the lemon.

3. Prune Whip

2 c. prunes — ½ c. sugar
2 egg whites — 1 tsp. lemon juice

Method.—Pick over and wash the prunes well, and let soak several hours in cold water to cover them. Cook in the same water until soft, remove the stones and rub the prunes through a strainer. Add the sugar, and cook 5 minutes to the consistency of marmalade. Beat the whites until stiff, add the prune mixture when cold, together with the lemon juice. Pile lightly in a buttered pudding dish and bake in a slow oven about 15 or 20 minutes. Serve cold with a boiled custard.

(*Basis for 2 girls, ⅛ rule.*)

HOME PROJECTS

1. Make price list of dried fruits.
2. Compare bulk with package goods as to quality and price.
3. Find out how raisins are prepared for the market.
4. Compare cost of dried fruit with cost of fresh fruit served for a breakfast; for a supper.

Note—Assign a topic, such as "the preparation of raisins for market," to one or two girls.

LESSON 3

✓ CEREALS

Cereals, or grains, are grasses the seeds of which are used for food. They are a food of first importance and should hold a regular place in the plan of daily meals.

Kinds.—There are many kinds, but the most commonly used are wheat, rice, rye, oats, Indian corn, and barley. From these are prepared the various breakfast foods found on the market.

COMPOSITION OF CEREALS

	Protein per cent	Fat per cent	Starch per cent	Mineral matter per cent	Water per cent
Oatmeal	15.6	7.3	68.0	1.9	7.2
Corn meal	8.9	2.2	75.1	0.9	12.9
Wheat flour (spring)	11.8	1.1	75.5	0.5	11.6
Wheat flour (winter)	10.4	1.0	75.6	0.5	12.5
Entire wheat flour	14.2	1.9	70.6	1.2	12.1
Graham flour	13.7	2.2	70.3	2.0	11.8
Pearl barley	9.3	1.0	77.6	1.3	10.8
Rye meal	7.1	0.9	78.5	0.8	12.7
Rice	7.8	0.4	79.4	0.4	12.4
Buckwheat flour	6.1	1.0	77.2	1.4	14.3
Macaroni	11.7	1.6	72.9	3.0	10.8

Composition.—Cereals for the most part contain all the foodstuffs but not in the right proportion.

All contain much starch, (about 75 per cent). The starch is the storehouse of nutriment that the plant has laid up either for its own later use or for the benefit of the young seedling when it starts to grow.

Unlike fruits, cereals contain considerable protein, or tissue-building material and little water. They are entirely lacking in sugar. Cereals are rich in mineral matter which lies in the layers directly under the outer shell of the grain. This outer shell, or husk, is hard indigestible fiber and is removed in the milling process. The germ, or vital living part of the grain, contains fat and tissue-building material. They contain ash also.

Vitamines are thought to be present in the germ as well as in the outer coats of the grain.

Food Value.—All foods containing much sugar or starch serve as heat and energy producers in the body. If the amount of starch or sugar present in a food is large compared with the amount of other substances, then we say the food is a heat and energy-producing food.

Fruits containing much sugar are heat and energy producers. Cereals containing much starch are heat and energy producers, but at the same time most cereals contain protein, which makes them tissue builders as well.

The great amount of starch in all cereals indicates that they should not be eaten alone, but along with other foods such as good whole milk or cream. Cereals are well absorbed in the body, ranking in that respect next to, and in some cases even above, the animal foods. This fact, combined with their compactness and richness in nutrients and their abundance and cheapness, places them in the front rank of human food.

Wheat has about the same nutritive value as oats, being a good tissue-building food and, containing less fiber than some cereals, it is more easily digested. Wheat breakfast foods are quite similar to Graham and whole-wheat flours in composition, and are about equal to them in nutritive value.

Oats are sold principally as oatmeal or rolled oats. Oatmeal is richer in food material than some other cereal foods, but, on account of its fiber, is not completely digested. It should be very thoroughly cooked. It is best adapted to strong, hard-working persons requiring greater energy and building food.

Oatmeal gruel is good for the growing child and is frequently combined with milk in the feeding of infants.

Of all cereal foods corn meal furnishes the largest amount of energy for a given cost. It is less digestible than wheat flour, on account of its coarse nature. Breakfast foods pre-

pared from corn are, at reasonable prices, economical and nourishing.

Rice is almost pure starch and, being notably deficient in protein and fat, as compared with wheat and oats, needs to be eaten with cream or butter.

Buckwheat and rye are similar to corn meal, but are more expensive.

Use of Cereals.—Cereals are used chiefly as breakfast foods, but may be used in the lunch or supper menu in ways other than as a cooked cereal with cream and sugar.

Cold cooked cereal makes very good croquettes. These, when served with tomato sauce or creamed peas, may take the place of meat in the meal. Cooked cereal may be packed in molds and, when cold, cut in slices and sautéd a good brown, then served with sirup.

Kinds.—Breakfast food cereals may be purchased in a variety of forms. Package cereals are much cleaner and more easily cared for than the cereals which come in bulk. The cost may be a little more, but they are worth it.

Breakfast cereals are of two kinds: (1) those which require cooking and (2) those ready to serve.

Those ready to serve naturally find a large market, since they have a pleasing flavor, save time and fuel in preparation, and are nutritious foods as well.

Those which require cooking vary a great deal in the time required, depending upon the amount of preparation they have had. Some have not been cooked, and some have been partially cooked.

The cooked cereals are best adapted to growing children and persons of active occupation, while the prepared cereals with fresh fruits are better suited to sedentary persons.

Variety in the diet is always welcome. All oatmeal or all cornflakes would soon become tiresome. Alternating a prepared cereal with one requiring home cooking affords the best plan and keeps the interest in the breakfast menu.

The reasons for cooking cereals are:—

1. To soften the cellulose.
2. To break down the starch and make it soft.
3. To improve the flavor.

The cellulose in cereals is tougher and coarser than that in fruits and different cereals vary in the quantity and coarseness of the fiber. For this reason different cereals require different time for cooking.

TABLE FOR COOKING OF CEREALS

Kind	Amount	Water	Salt	Method	Time
Corn meal.....	1 c.	3½ c.	1 tsp.	Boil	2 hrs.
Rolled oats....	1 c.	2 c.	1 tsp.	Steam	2 to 3 hrs.
Rice.....	1 c.	4 to 5 c.	2 or 3 tsp.	Steam	2 to 3 hrs.
Rice.....	1 c.	4 to 5 c.	2 to 3 tsp.	Boil	1 hr.
Hominy.....	1 c.	4 c.	1 tsp.	Steam	4 to 5 hrs.
Wheat mixtures	1 c.	4 c.	1 tsp.	Steam	1 to 3 hrs.

Note: Some brands of rolled oats, specially prepared, require only 3 minutes for cooking.

QUESTIONS AND PROBLEMS

1. Why do cereals require little or no sugar when served?

2. What is the reason for adding cereals directly to boiling water when putting them on to cook?

3. Do cereals require thorough masticating? Why?

APPLICATION

1. Rolled Oats

1 c. rolled oats — 4½ c. boiling water — 1½ tsp. salt

Method.—Put the boiling water in the upper part of a double boiler and gradually add the rolled oats and salt. Cook over the fire without the lower part for 5 or 10 minutes; then set in the lower part of the boiler and steam for 2 or 3 hours. Stir it once in a while. Rolled oats is best cooked one day, reheated and served the next morning, to insure its being well cooked.

Note.—Berries, sliced peaches, bananas, apple sauce, and dates or figs cut in pieces are good additions to cereals. Left-over rolled oats may be added to a muffin mixture before baking.

2. Cream of Wheat

1 c. cream of wheat 4 c. boiling water
½ tsp. salt

Method.—Mix the cream of wheat and salt, add slowly to the boiling water in the upper part of the double boiler, stirring constantly. Cover and steam until done, about 45 to 50 minutes. Serve with sugar and cream.

3. Corn Meal Mush

1 c. corn meal 1 c. cold milk
1 tbsp. flour 2 c. boiling water
1½ tsp. salt

Method.—Mix the meal, flour, and salt together thoroughly. Put in the upper part of a double boiler, add the cold milk and stir until smooth. Add the boiling water slowly and cook all directly over the fire for 10 minutes, stirring constantly. Put in double boiler over boiling water; cover and cook 5 hours. Serve hot with cream and sugar.

4. Fried Corn Meal Mush

Method.—Use corn meal mush prepared as above, and pack in a wet mold or bread pan. Set away to cool for several hours. When cold, cut in thin slices and sauté in hot butter or drippings in a hot frying pan, until well browned on both sides. Serve plain or with butter or maple sirup.

HOME PROJECTS

1. Look up the source of wheat.
2. Compile a list of prepared cereal foods.
3. Compile a list of uncooked cereals.
4. Compare as to prices and food value.
5. Find out how bulk cereals compare in price with package goods and whether there is a difference in the price in different stores.
6. Prepare a cereal for breakfast in the double boiler once during the week.

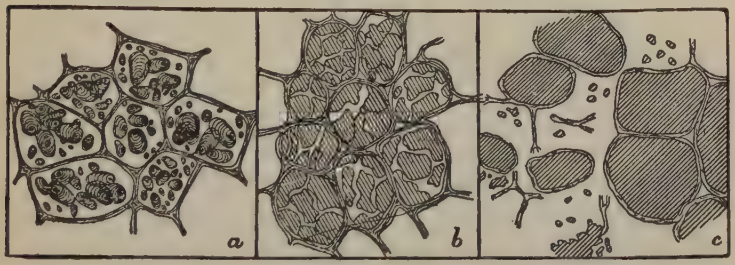
LESSON 4

STARCH

Starch in the prepared form is a firm white powder, consisting of tiny starch grains. Starch and sugar are very closely related, having much the same composition and serving the same purpose in the body. Like members of most families, however, each has its own peculiarities and must be treated differently in order to best serve its purpose.

Source.—It is found most abundant in the cereals, tapioca, potatoes, and other vegetable products. Starch is not formed in the animal body.

Structure.—Starch as found in the vegetable world is the



Effect of cooking on starch: *a*, cells of a raw potato, showing starch grains and framework; *b*, cells of a partially cooked potato; *c* cells of a thoroughly boiled potato. (Hutchinson.)

storehouse of nutriment that the plant has laid up either for its own later use or for the benefit of the young seedling when it starts to grow.

It consists of tiny grains invisible to the eye. Each grain is made up of a network of woody fiber, or cellulose, and the whole is surrounded by an outer covering to hold it in place. All in and through this network of fiber exists the starch material.

Food Value.—Starch gives heat and energy to the body but does not build or repair tissues, and when used alone

it can not sustain life; it must be used with tissue-forming foods. Starch must be changed to sugar by digestive processes before it can be used in the body.

Digestion of Starch Foods.—Digestion means making foods soluble or in a condition where they are easily used by the body. All solid foods must become softened and practically soluble before they can pass through the walls of the digestive tract.

Substances like starch must be changed to a form of sugar before absorption can take place. No starch is used in the body as starch. There are two ways of changing starch to sugar. One is by the use of an acid in the presence of heat. The other is by the action of substances called ferments. Some ferments have the power of changing starch to sugars, some change sugar into alcohol and others are useful in making bread with yeast.

The first stage of digestion is in the mouth. The teeth cut and grind food into small pieces and the glands secrete saliva which is mixed with the food. The saliva aids in softening the food so that it can be more easily swallowed.

There is a *ferment* in the saliva called *ptyalin* which acts directly on the starchy foods, partially changing them to a form of sugar called *dextrose.*

The food is then swallowed and passes into the stomach, where the second stage of digestion begins. There is no change in starchy foods in the stomach other than a continued softening process.

The third stage of digestion is in the small intestine. Here the food is met by the pancreatic juice. This is the "Man of All Work" and the "Police Force" in the digestive tract, for it is the one digestive juice which acts upon all classes of food and has special properties or "officers" for taking care of each food. If anything has escaped digestion up until it reaches the intestine, the pancreatic juice takes care of it and changes it. Food that has been partly changed and

made ready in the mouth and stomach for further digestion is here converted into proper soluble form. The special ferment in the pancreatic juice which acts upon the starch is *amylopsin*. Amylopsin changes starch and dextrose in the food mass to completely soluble sugar form.

Absorption of the food takes place through the walls of the intestine. All starchy food must be completely changed to soluble sugar before it can be absorbed. Starch which escapes digestion is a loss to the body.

Starchy food must not be given to infants and small children before the body is ready to manufacture the necessary starch-converting ferments.

EXPERIMENTS

Effects of Water, Heat, and Iodine on Starch

1. Put a tsp. of starch in a glass containing ¼ c. of water. Watch it. What happens?
2. Mix 1 tsp. of starch with ¼ c. cold water to form a paste. Add ½ c. boiling water. See what happens.
3. Pour ½ c. boiling water over 1 tsp. of starch, without first mixing cold water. What happens? Break one of the lumps.
4. Mix starch grains with melted butter; add boiling water.
5. Mix starch with granulated sugar; add boiling water.
6. Chew a cracker to a pulp. Place the mass on a paper, drop a few drops of iodine on it. Watch the change and color. Iodine causes the starch to turn blue.
7. Drop a few drops of iodine on plain cracker. Compare with Experiment 6.
8. Drop a few drops of iodine on a little rice.
9. Test a spoonful of flour as in Experiment 8.
10. Heat a spoonful of flour in a pan or test tube until it turns brown. Test it for starch.

Cooking of Starchy Food.—Sugar is soluble in cold and hot water. Starch is not soluble in either cold or hot water. Starch grains must be separated in some way before boiling water is added. Thorough cooking in water at high temperature is necessary to break down the starch grains.

Starch for Thickening.—Sauces, soups, puddings, and ice cream are thickened by a commercial starch called cornstarch. This must always be blended with cold water or milk before adding to the boiling liquid.

RICE

Rice is a cereal, a native of southeastern Asia, and now grown in large quantities in China, Japan, Central America, and our Southern states.

Rice is prepared for market much the same as wheat. It is shocked, stacked, thrashed, and then sent to a hulling mill. Here the coat is separated from the white grain, which is polished. This polishing removes a coat rich in mineral matter and vitamines; so the finished product has less food value. Try to obtain unpolished rice.

Rice is best when six months old. In China they prefer it three years old.

Food Value.—Rice is the lowest in food value of all cereals, for it is almost pure starch. It must, therefore, be eaten with other food rich in protein and fat to supply all the needs of the body.

Rice is the principal food of one third of the people of the world. The people in the countries where it grows use it to supply their starchy food as we use the Irish potato. It is in season the year round.

A disease called beri-beri, well known in the Orient, is common among the classes which live solely on one food such as polished rice or milled white flour. It is due to the lack of vitamine B in their diet and can be overcome by using a more varied diet of fruit and vegetables.

To Wash Rice.—Put in a strainer and place in cold water. Rub thoroughly, changing the water several times until the rice is clean. Sometimes arsenic has been used to whiten rice, and poisoning may result unless the rice has been thoroughly washed.

Ways of Cooking.—Rice may be cooked in various ways.

1. Boiling—Use as a vegetable in place of potatoes.
2. Steaming—in milk or water. Use as a cereal or for puddings.
3. Boiled rice may be combined with tomatoes or cheese and baked.
4. Rice is used in soups.
5. Rice with eggs makes a good pudding.

Fruit with rice or other cereal adds sugar and flavoring to the dish, and is a pleasant change. Use dates or raisins.

TAPIOCA

Tapioca is almost wholely starch and is the commercial form prepared from the roots of the cassava plant, a native of South America. It is used extensively for thickening puddings.

Tapioca comes prepared in two forms, pearl tapioca and minute tapioca which is granulated. Pearl tapioca requires soaking over night in plenty of water to cover before it can be cooked. Minute tapioca does not require soaking and is more quickly prepared.

QUESTIONS AND PROBLEMS

1. From your home project work last week did you find much difference in stores as to prices, appearance of food, cleanliness, and personal service?
2. Why can flour be substituted for cornstarch to thicken puddings?
3. What happens to the starch in bread when bread is toasted?
4. How many ways of serving rice do you know?

APPLICATION

1. Boiled Rice

1 c. rice 2 tsp. salt 2 qt. water

Method.—Pick over and wash the rice. When the water boils rapidly drop in the rice slowly, so as not to stop the boiling. Stir occasionally to keep the grains from settling to the bottom. Boil rapidly, uncovered, 20 to 30 minutes, or until the grains crush easily between the fingers. Add the salt when nearly done. Pour into a

strainer to drain, rinse with hot water to remove the loose starch. Set the strainer in the oven or put the rice in the serving dish and set in the hot oven a few minutes to dry the rice. Good boiled rice is white and soft and each grain is separate.

(*Basis for* 2 *girls*, 2 *tbsp. rice.*)

2. Steamed Rice

Method.—Prepare rice as for boiling, and cook with water or milk and salt, in the double boiler. Cover and cook one hour, or until tender and all the liquid is absorbed. Milk is best to use for steamed rice. Raisins may be used and the rice served with milk or cream as a pudding or dessert.

3. Baked Rice and Cheese

Put cooked rice in baking dish, adding enough milk to nearly cover rice. Put a layer of crumbs on top—then a layer of grated cheese. Bake in oven about 20 minutes. Serve as vegetable or hot dish.

4. Rice Pudding (uncooked rice)

1 qt. milk	3 tbsp. rice
¾ c. sugar	½ tsp. salt
½ tsp. cinnamon	2 tsp. butter

Method.—Pick over and wash the rice well. Mix salt, spice, and sugar and add to the rice. Put into a buttered baking dish or casserole, add the milk, put bits of butter over the top and bake 3 hours in a very moderate oven. Stir occasionally during the first hour of cooking. Never let the milk boil.

½ cup of raisins makes a pleasing addition to the dish. Serve hot or cold.

(*Basis for* 2 *girls*, ¼ *rule.*)

5. Rice Pudding (cooked rice)

1 c. rice	1 tsp. salt
2 c. milk	1 egg
1 tbsp. butter	½ c. sugar
1 pt. cooked fruit	½ c. bread crumbs

Method.—Steam the rice in milk in a double boiler about one half hour. Add the butter while hot, then the salt, sugar, and the beaten egg. Cook five minutes longer. Butter a pudding mold, line it with bread crumbs, add a half-inch layer of rice, then a layer of cooked fruit. Continue with a layer of rice and one of fruit. Cover the top with crumbs and bake 20 minutes in a moderate oven. Turn out on a platter and serve with a soft custard or fruit sauce.

Peaches, apricots, berries, or pineapple make pleasing additions.

Crushed macaroons or stale cake crumbs may be used in place of bread crumbs.

(*Basis for 2 girls, ¼ rule.*)

6. Cornstarch Pudding

2 tbsp. cornstarch	2 eggs
1 qt. milk	1 tsp. butter
4 tbsp. sugar	Pinch of salt

Method.—Mix the cornstarch with a small amount of milk and stir until a smooth paste. Heat the remainder of the milk in a double boiler. When scalded, add the hot milk to the paste mixture. Add the sugar and salt. Stir till the sugar is dissolved. Then pour slowly into the well-beaten eggs. Return to the boiler and cook a few minutes until the mixture thickens, stirring constantly. Cool and add the flavoring, turn into molds, and serve cold with boiled custard, cream, or chocolate sauce.

(*Basis for 2 girls, ¼ rule.*)

7. Apple Tapioca

1 c. pearl or minute tapioca	½ tsp. salt
2 c. cold water	8 sour apples
2½ c. boiling water	½ c. sugar

Method.—Soak the tapioca in cold water an hour or more, drain, and add the boiling water and salt. Cook in double boiler until transparent. Core, pare, and slice the apples, put in buttered baking dish, cover with sugar, then with tapioca. Bake in a moderate oven until the fruit is done. Serve with sugar and cream. Minute tapioca does not require soaking. Peaches may be used in place of apples.

(*Basis for 2 girls, ⅛ rule.*)

HOME PROJECTS

1. Prepare rice for dinner and serve it as a vegetable in place of potatoes.
2. Make a cornstarch pudding for one dessert during the week.

LESSON 5

✓ TISSUE-BUILDING FOOD—EGGS

As we have learned, the body requires a large amount of energy foods to carry on all its activities. It must also have tissue-building food to furnish material for the growth and repair of tissues. This demand for tissue-building food is greatest in babies and children, when most of the building is in progress. In adults only enough building material is necessary to keep in repair the structure already built.

Protein is the only class of foodstuff which will build and repair the muscles of the body. There are different kinds of protein. Some proteins promote growth and support life. These are termed "complete proteins," since they may be depended upon to serve all the growth needs of the body. Other proteins are called "incomplete proteins," since they promote life, but can not be depended upon to promote life if the "complete proteins" are absent in the diet.

Foods which contain "complete proteins" are: Eggs, milk, cheese, meat, and fish. Foods which contain "incomplete proteins" are: Gelatin, beans, peas.

In planning the meals for the family some "complete proteins" must be included in the diet for each member of the family each day. The amount depends to a great extent upon the age and activity of each person.

Eggs most commonly used in cooking are hens' eggs, although eggs of other domestic fowls are used also.

✓**Structure.**—A hen's egg consists of the following parts:—

1. The shell.
2. Two tough membranes just inside the shell.
3. The white, a clear, jelly-like substance.
4. The yolk, which is surrounded by a thin membrane and held in place by—
5. Two twisted cords.

6. The embryo, in the yolk. This embroyo is the vital part from which the chick grows, much as wheat grows from the germ in the grain. The contents of the egg furnish the embryo food, just as starch does the germ of grain.

7. Air space, found at the large end of the egg between the two membranes.

Composition.—*The shell* is composed of mineral matter, chiefly lime.

The white, or *albumen*, is nearly pure albumin and water. Albumin is a sticky substance, and is a protein.

The yolk contains much fat or oil, some albumin, mineral matter, and water. The mineral matter consists of phosphorus, calcium, iron, lime, and sulphur.

COMPOSITION OF EGGS

Protein	Fat	Mineral matter	Water	Vitamines
14.9%	10.6%	1%	73.5%	A and B

Food Value.—On account of the large amount of protein in eggs, they are valuable as a tissue-building food, and may be used as a meat substitute. One pound of eggs, usually about nine, contains as much nutriment as one pound of meat.

Raw eggs and those properly cooked are very easily digested and assimilated in the body.

Eggs cooked in boiling water until tough are as completely digested as those cooked below the boiling point, but require much longer time for digestion. They should not be served to invalids or anyone having any difficulty with digestion.

Tests for Fresh Eggs.—The following tests are reliable:

1. Slightly rough shells.

2. Fresh eggs sink to the bottom in cold water. Stale eggs float.

3. Fresh eggs are clear when placed between the eye and a bright light in a dark room. Stale eggs are cloudy. This method of testing is used extensively in egg markets and is called "candling."

Care of Eggs.—As soon as eggs come from the market wipe any soiled ones with a damp cloth, and put only clean, fresh eggs in the ice box.

Keep eggs in a cool, dry place, preferably the lower part of the ice box.

Do not keep in a place where there is food with strong odors, which eggs readily absorb.

Egg yolks will keep fresh for some time if covered with clean, cold water and kept in a cool place.

Preservation of Eggs.—Protein foods spoil more readily than any other class of foods. They contain or come in contact in the air with certain *bacteria* which cause decomposition. Eggshells are porous and air enters into the shell as the water evaporates out of the egg. Any method which will exclude air will help keep eggs fresh. Only fresh clean eggs obtained in the spring and early summer when eggs are plentiful and the price low should be preserved.

Infertile eggs will keep much longer than fertile ones.

The packing or preserving material for eggs must be absolutely clean, since eggs are easily tainted in flavor. Eggs may be preserved in the following ways:—

1. Pack dry in sawdust, salt, bran, oats, or sand, with the small end down.
2. Put in jars containing salt brine, limewater, or water glass enough to cover the eggs.
3. Coat with paraffin, lard, oil, or water glass.
4. Put in cold storage.

The Water-glass Method.—The water-glass method is the most satisfactory home means of preserving eggs, and is very easily applied. For every quart of water glass (silicate of soda) solution use 9 quarts of boiled water that has been cooled. Mix the ingredients thoroughly and put into a clean stone jar. Place the eggs in the solution and see that all are well covered by the liquid. Keep the jars in a cool place and well covered to prevent evaporation.

Eggs may also be dipped in undiluted water glass, and, after drying, stored in regular egg cases.

Eggs preserved in water glass are as good as fresh eggs for all cooking purposes.

The Cold Storage Method.—Eggs are produced in greatest abundance in the spring and summer months. As they are very plentiful then they are correspondingly cheap, but very scarce and expensive in the winter. The cold storage system and refrigerator cars extend both the time of marketing and marketing area of eggs, so that egg prices have become more uniform throughout the year and a more plentiful supply is available in the winter months than there would be naturally.

When properly handled and kept at a temperature just above freezing, 32° to 40° F., cold-storage eggs are wholesome. There is a law against keeping them too long.

EXPERIMENTS

Effect of Heat on Albumin

1. Put some egg white into a tumbler of cold water and shake or beat well. Notice the results.
2. Put some egg white in boiling water. What happens?
3. Put an egg in boiling water, remove from the fire, and let stand 10 minutes. Notice consistency of the white.
4. Put an egg in boiling water and boil 10 minutes; remove from the fire and compare with the result of Experiment 3.
5. Put an egg in cold water and bring to the boiling point. Remove from the fire and compare with Experiments 3 and 4.

Cooking Eggs.—By the experiments above we find that albumin begins to coagulate at 160° F. A boiling temperture makes albumin hard and tough. Eggs and all egg mixtures must be cooked at a moderate temperature.

How to Break Eggs.—Break eggs separately into a dish to make sure they are fresh before adding to other eggs or to a mixture. Hold the egg in the left hand and strike it with a knife blade. Press the thumbs into the crack and pull the shell apart. Or strike the egg against the side of a mixing bowl and then open with the thumbs.

To Separate White from Yolk.—Crack egg, hold yolk in one half of the shell and let the white run on a plate. Then slip the yolk to the other half of the shell, holding the edges of the shell together, and drain off all the white. Put yolk into a bowl. Clean out the egg shells with the finger so that all the albumen is used.

QUESTIONS AND PROBLEMS

1. What foodstuff is lacking in eggs?
2. Name foods containing "complete proteins."
3. Names two foods containing "incomplete proteins."
4. Compare the temperature for cooking eggs with that for cooking starch.
5. Why do stale eggs float in water?
6. Does saliva have any action on protein foods?
7. What makes eggshells of use in clearing coffee?
8. What causes eggs to spoil?
9. Do "strictly fresh" eggs mean as much in your market?

APPLICATION

1. Soft-Cooked Eggs

Method.—(*a*) Allow about 1 pint of water, or enough to cover 2 eggs. Place eggs in cold water in a saucepan.

Bring water to boiling point slowly. Remove eggs and serve in hot cups.

(*b*) Place eggs in a saucepan containing enough boiling water to cover. Cover the pan and let stand on back of the stove from 8 to 10 minutes.

2. Hard-Cooked Eggs

Method.—Place eggs in a saucepan containing enough boiling water to cover. Cover the pan and let stand where water will keep hot, but not boil, for 40 or 45 minutes; or boil slowly for 8 minutes.

3. Poached Eggs

Method.—Prepare a slice of buttered toast for each egg. Cut with a round cutter or muffin ring. Keep warm. Have ready a shallow pan containing enough salted water to cover the eggs. Let the water boil and then remove pan to back of stove. Break each egg separately into a saucer and slip it gently into the water, being careful that water does not reach the boiling point. Cook until the white is firm and a film forms over the top of the yolk. Remove the egg from the water with a

skimmer or a griddle-cake turner. Drain, and place the eggs on toast. Garnish with parsley, and serve with bacon, if you like.

(*Basis for* 2 *girls*, 1 *egg.*)

4. Eggs a la Suisse

4 eggs	Salt
½ c. milk	White pepper
1 tbsp. butter	Cayenne

2 tbsp. grated cheese

Method.—Melt butter in a small omelet pan; add milk. Break eggs separately into a saucer and slip gently into the pan, one at a time; sprinkle with salt, pepper, and a few grain of cayenne. When whites are nearly firm, sprinkle with cheese. Finish cooking, and serve on buttered toast. Strain milk over the toast.

5. Baked Eggs

Method.—Butter a ramekin or muffin tin. Line with fine cracker crumbs. Break egg into a cup and slip into ramekin; season, and cover with buttered crumbs. Bake in moderate oven till crumbs are brown.

6. Stuffed Eggs

1 tsp. vinegar	1 tbsp. melted butter
¼ tsp. mustard	Salt and pepper

Hard-boiled eggs

Method.—Put eggs into cold water, bring slowly to boiling point, and boil 8 to 10 minutes. Drop into cold water. Remove shell, cut egg in half crosswise, take out the yolk, mash, mix with mixture, and refill whites. These are nice for supper and the lunch box.

7. Toast

Method.—Cut bread into slices ¼ to ½ inch thick. Toast an even brown on one side and then turn and toast the other side. The heat should not be too great, else the bread will burn before the starch is properly dextrinized.

8. Bacon

Method.—Put thin slices of bacon in a frying pan, add 1 tbsp. of water, cook slowly. Turn the bacon as it cooks and browns, so that it browns evenly. When brown, drain from the fat and serve hot. The water turns to steam and makes the bacon "curl."

HOME PROJECTS

1. Prepare eggs in some way three times next week.
2. Separate the eggs for mother when she is baking, so that you learn to do it skillfully.
3. Get the prices of eggs in different stores.

LESSON 6

EGGS

Digestion of Proteins.—All food should be thoroughly masticated, that it may be more easily digested. Mastication is the process of chewing or grinding food into small pieces and mixing it with the saliva to make it easier to swallow. As we learned in the digestion of starch the saliva acts upon starch and causes a chemical change in addition to the mechanical one of chewing. Protein food undergoes no chemical change in the mouth, but enters the stomach finely ground and mixed with the saliva.

In the stomach the pepsin of the gastric juice and the hydrochloric acid act on the proteins. They are changed into peptones, which are more easily affected by other digestive juices. From the stomach they pass into the intestine where the pancreatic juice makes them soluble.

The special ferment of the pancreatic juice which acts on protein substances is called *trypsin*. Absorption then begins. Foods not absorbed pass through the small intestine and are eliminated. There is one digestive juice in the large intestine called the intestinal juice whose duty it is to continue the dissolving process of all food. Very little absorption takes place from the large intestine, however. Most food reaching the large intestine is bulk and waste matter.

Since all protein food is a ready prey to bacteria, decomposition takes place very rapidly. If proteins are not properly digested in the stomach, gastric disturbances are sure to result. Too much acid in the stomach or not enough pepsin are the chief causes of faulty digestion of protein food.

An omelet is a mixture of beaten eggs, liquid, and seasoning. It is made light by beating air into the eggs and cooking the mixture until the albumen of the eggs is coagulated. The moisture in the mixture turns to steam which aids in

raising the omelet. Omelets fall when cold, since there is no flour in the mixture to hold it up and the steam turns back to water when cold.

Omelets must be served the minute they are ready. Guests may be asked to wait for the omelet.

The number of eggs to use in an omelet depends upon the number of persons to be served. Allow one egg to each person. Individual omelets are easier to handle than a large one and are nice to use for invalids. For the family, if more than four eggs are needed, it is better to make two omelets than to try to bake one having too many eggs. Large ones are hard to handle and the eggs do not get evenly baked without danger that some part of the omelet will be too well done.

Methods of Combining Mixtures.—(1) Stirring, (2) beating, (3) folding, and (4) cutting.

Stirring is used in combining when air is not necessary to the ingredients. Use circular motion, round and round until all is mixed.

Beating is used to introduce air into a mixture. Lift the mixture up and over on a spoon with a rapid movement. Continue until the mixture is full of bubbles.

Folding is used (*a*) to add a beaten mixture to another; as, in adding beaten whites to a batter; or (*b*) to add ingredients, as baking powder, for example, to a batter having beaten eggs in it, without breaking the air bubbles already contained in the mixture.

Cutting is used to add fat to flour mixtures, for example, in making biscuit.

EXPERIMENTS

Effects of Different Methods of Beating Eggs

1. Beat a whole egg in a bowl with a rotary beater.
2. Beat the yolk of an egg alone with a rotary beater.
3. Beat the white of an egg alone with a rotary beater.

Note difference in increase of volume in experiments 1, 2, and 3.

4. Beat an egg white with a wire whip. Compare this with the white beaten with a rotary beater. Is there any difference?

Beating Eggs.—Eggs are beaten in order to introduce air into a mixture. The elasticity of the albumen of the egg makes it possible to enfold air into the egg.

Ways of Beating.—Yolks and whites are beaten differently.

1. Beat yolks in a bowl with a rotary beater.
2. Beat whites on a platter with a wire whisk or in a large bowl with a double rotary beater.

Consistency when Beaten.— *Yolks*, when well beaten, are thick and lighter colored than before beating.

Whites are beaten *stiff* when the wisk comes out clean.

They are beaten *dry* when the gloss is gone and the beaten mixture comes off the beater easily.

QUESTIONS AND PROBLEMS

1. What makes the increase in volume of eggs when beaten?
2. Is there any real reason for care in separating eggs?
3. How many eggs would be needed to make an omelet for four?
4. Which do you regard the best method of cooking eggs—by boiling or cooking in hot water below boiling? Which do you like best?
5. Upon what does an omelet depend for its lightness?
6. Is it possible to beat air into materials like flour and sirup?
7. What happens to the water in the omelet when it is cooked?
8. Why do omelets fall?

APPLICATION

1. Puffy Omelet

3 eggs	¼ tsp. salt
3 tbsp. water	White pepper

1 tbsp. fat

Method.—Separate yolks from whites of eggs. Beat yolks until thick; add water and salt. Fold in beaten whites of egg. Melt fat in an omelet pan, turn in egg mixture, spread evenly, cook slowly, occasionally turning the pan so that the omelet may brown evenly. When it is well puffed up and delicately browned underneath, place pan in hot oven to finish cooking the top. The omelet is cooked if it is firm to the touch when pressed with the finger. Fold, and turn on a hot platter. Serve at once.

(*Basis for* 2 *girls*, 1 *egg.*)

To Fold an Omelet.—Hold the omelet pan by the handle with the left hand. Crease the omelet slightly across the center at right angles to the handle of the pan. Slip the spatula under the edge of the omelet farthest from the handle of the pan and, tipping the pan up, fold the omelet over half way towards the handle. With the right hand invert the hot platter over the pan, and with a quick movement turn the omelet out of the pan upon the platter. Garnish with parsley and serve *immediately.* The success of an omelet of this kind depends upon the amount of air enclosed in the egg and the expansion of the air in cooking.

Note.—One group make puffy omelet, using 1 egg as a basis, and another group make creamy omelet, using 1 egg as a basis, and compare the two as to general appearance, texture, and height, and then again after 5 minutes.

VARIATIONS OF PUFFY OMELET

A Fancy Omelet may be made by the addition of grated cheese, minced ham, or other meat sprinkled over the top just before folding. Parsley, oysters, or vegetables finely cut may also be used.

A Sweet Omelet is made by spreading soft jelly or preserves and powdered sugar over the top.

2. French Omelet

3 eggs
1 tbsp. hot water or milk
½ tsp. salt
1 tbsp. fat
Pepper

Method.—Beat eggs lightly, add water and seasoning. Heat the omelet pan, melt the fat and let it run over the bottom and sides of the pan. Turn in the mixture, and cook slowly. When thick at one side, roll the mixture over to the other side, like a jelly roll. When all is evenly cooked, roll out upon a hot plate. Garnish and serve.

3. Creamy Omelet

1 tbsp. flour
½ c. milk
3 eggs
1 tbsp. fat
½ tsp. salt

Method.—Mix the flour with a little milk to form a smooth paste, then gradually add the remainder of the milk. Cook until it thickens and the starch in the flour is cooked. Then cool. Make the creamy omelet just like a puffy omelet, using the half cupful of thickened milk in place of water.

The thickening in the milk aids in holding air in the omelet. Creamy omelets do not fall like puffy omelets and are more satisfactory to serve for a family. Creamed peas or sweetbreads in a border around the omelet when served makes a good meat substitute dish.

4. Scrambled Eggs

5 eggs — ½ tsp. salt
½ c. milk — ⅛ tsp. pepper
2 tbsp. bacon drippings

Method.—Beat eggs slightly, add salt, pepper, and milk. Melt fat in an omelet pan, turn in egg mixture and cook slowly, scraping from the bottom and sides of the pan constantly as the mixture thickens. Cook until creamy. Turn it upon a hot dish and serve at once.

5. Scrambled Eggs with Tomato Sauce

6 eggs — 2 tsp. sugar
1 ¾c. tomato sauce — 1 slice onion
4 tbsp. fat — ½ tsp. salt
Pepper

Method.—Simmer tomatoes and sugar. Fry onion in fat 3 minutes, and add eggs which have been slightly beaten and added to tomato sauce. Add a speck of soda to the tomato sauce. Stir slowly until eggs are cooked and jelly-like.

6. French Toast

2 eggs — 1 c. milk
½ tsp. salt — 6 slices of bread
1 tsp. sugar

Method.—Beat the eggs slightly, add salt, sugar, and milk. Strain and dip the bread in the mixture, cook on a well-oiled griddle until brown, turn, and brown the other side.

The center of each piece of bread may be cut out with a small biscuit cutter and, after it is placed on the griddle, an egg slipped into the center of each piece. Sauté as plain French Toast.

HOME PROJECTS

1. Plan two ways of preparing eggs for breakfast. Serve at home. Plan two ways of preparing eggs for lunch. Serve at home.
2. Weigh out 1 lb. of eggs. How many are there? How do they vary?
3. Make a puffy omelet or creamy omelet at home for the family. Do not attempt too large a one for your first effort alone.

LESSON 7

MILK

Milk is of very great importance as a food No diet is complete without it and the state of one's health is largely dependent on it. There is no complete substitute for it.

Good milk is a yellowish-white liquid with faint odor and a sweet taste. When allowed to stand, a thick cream rises to the top, and there is no sediment. Rich milk clings to the sides of the glass; poor milk has a bluish-white color and contains little cream.

Most states have standard requirements for milk, which establish the minimum amount of fat and solids that milk must contain and that all creameries and dealers are compelled to observe. This regulation prevents dealers from adding water to the milk and removing some of the fat. Each state establishes its own standards. There is, therefore, some difference in state requirements; but in the main the general proportions are the same. In milk there must be 3.25% butterfat, in cream 20%, and in ice cream 12%. There may be a slight variance in the composition of milk from different herds or dairies, but the general proportions of foodstuffs are about the same.

Production and Use.—The estimated production of milk in the United States in 1921 was approximately 99,000,000,000 pounds. Milk has not only an extensive use as such, but is used for making butter, cheese, condensed and evaporated milk, malted milk, milk chocolate and candy, oleomargarin and ice cream.

Statistics show that on an average each person in the United States consumes in one year 49 gallons of milk and cream and 16 pounds of butter.

Composition.—Different samples of milk may vary greatly in composition, especially in the quantity of fat.

AVERAGE COMPOSITION OF GOOD MILK

Water	Protein	Carbohydrates	Fat	Mineral matter	Vitamines
87%	3.3%	5%	4%	.7%	A B C

As the above table shows, about 87% of milk is water. The protein in milk is of two kinds, namely, casein and albumin. There is about six times as much casein as albumin. The sugar in milk is called *lactose*.

The mineral salts in milk are principally lime, iron, and phosphates.

The vitamines A, B, and C are all present in milk. Vitamine A in the fat of milk is in greater amount than the other vitamines in the other part of milk.

The fat in milk is held in suspension in the form of minute globules, so finely divided that as many as ten billion may be contained in a single drop. These gradually rise to the surface, forming cream.

Food Value.—When the foodstuffs are in the right proportion, milk is a perfect food for babies and growing children and it also is a good food for grown persons. Mother's milk varies in composition from cow's milk mainly in the amount of milk sugar it contains. When cow's milk must be used for babies, sugar in easily digested form (called *dextrose*) is added.

The large amount of water in milk is useful for the young in building and filling out the tissues. For an older person, however, milk contains too much water and not enough carbohydrates; about five quarts a day would have to be consumed to supply the body needs, if no other food were used. Yet milk is really a concentrated food, since fully a third of the solid portion is protein and another third is fat. These nutrients are in finely divided form and easily digested.

The casein in milk is one of the best body builders we have. The milk sugar and the plentiful minerals in milk are all very easily digested and of ready use in the body.

Milk is not only a tissue builder and heat and energy-producing food, but is also a growth-promoting food on account of the vitamines it contains. It promotes growth in children and health for persons of all ages.

Milk, therefore, should be used in some form in the meals every day. A daily allowance of one pint of milk for each adult and one quart for each child under six years of age has been estimated as an appropriate quantity.

Undernourishment of children is in most cases due to lack of the necessary amount of milk. Many schools furnish free milk during the morning session to undernourished children coming from poor home conditions.

There is no better way of increasing the food value of a meal than by the addition of milk in some form.

Digestion of Milk.—The protein in milk is casein. Casein differs from other proteins in a peculiar way. It is precipitated, or thickened, when in the presence of an acid. The acid in sour milk acts on the casein, causing it to become thick and separates it from the water in the milk. A like change in milk occurs in the stomach during digestion. The gastric juice contains rennin and pepsin which act on protein food.

Rennin has the same effect as an acid upon casein. Milk, to be digested, must have the casein thickened and separated from the water. For this reason rennin is necessary in the stomach for the digestion of milk. Some persons do not have enough rennin and are consequently troubled with indigestion.

A great deal of rennin is found in the walls of the calf's stomach. This is the source of rennin for making dyspepsia tablets and junket tablets used in thickening custards for invalids.

Souring of Milk.—Clean milk from reliable sources should not contain any disease-carrying bacteria. When milk is warm, the bacteria increase very rapidly. They feed upon

the sugar in the milk and lactic acid is formed. Lactic acid increases in amount as the souring process continues.

The thick part of sour milk is called "curd" and contains the casein. The thin part is called "whey" and contains the water together with some of the milk sugar.

Clean fresh milk carefully handled to exclude dirt should keep sweet for several days.

Adulteration of Milk.—The fat is so valuable for cream or butter that sometimes much of it is removed before the milk is sold. The commonest method of adulteration is to add water, which, unless much is added, is hard to detect. What is worse, chemical preservatives are sometimes added to kill bacteria or retard their growth, in order to keep the milk sweet and carry it great distances. The chemicals used are boric acid, formalin, and salicylic acid. These are very harmful, especially to infants, and conceal unclean methods of handling milk. Such milk can be detected when it does not sour easily or becomes thick and develops a bitter taste. State and national pure-food laws and city ordinances forbid adulteration and artificial preservatives.

Purchase and Care of Milk.—No other food so quickly absorbs odors and impurities and requires more careful handling. It is often a means of spreading certain diseases, such as diphtheria, typhoid, and scarlet fever. The secret of clean milk is production under clean surroundings, prompt cooling, and keeping it cool and protected from dust and other impurities until it is used in the home.

Some rules to follow are:—

1. Buy from sources you know to be sanitary and pure.
2. Buy milk in covered bottles rather than in bulk.
3. Keep milk in scalded glass or earthen dishes or in the original bottles.
4. Keep milk cold, for then germs develop much less rapidly.
5. Keep milk covered from flies, dust, and odors.

6. Milk absorbs odors very readily. Keep milk and butter in the lower part of the ice box or in a place removed from meat and vegetables.

7. Wipe the outside of milk bottles before putting them in the ice box.

Pasteurization.—In large cities most of the milk supply is pasteurized. This process kills dangerous disease germs.

Pasteurization consists in heating the milk to a temperature of from 150° to 180° F. for 20 minutes or more and then rapidly cooling it to 50° F. or lower.

Sterilization consists in heating milk to the boiling point for 15 or 20 minutes. The process may be repeated after an interval to make the result doubly certain. This operation destroys practically all bacteria, but it has the disadvantage that the taste is spoiled for many persons and also that the milk is probably made less digestible.

Condensed Milk.—This is milk that is evaporated in vacuum pans to one third or one fourth its original bulk and then sealed in air-tight cans, in which it will keep indefinitely. Sometimes sugar is added to increase its keeping qualities. Condensed milk may be carried and kept in many places, such as on board ship and in the tropics, where fresh milk is not obtainable. When it is to be used, increase its volume two or three times by adding water. It may then be used the same as fresh milk.

Certified milk is guaranteed by the producer to be up to standard requirements and especially pure. The law requires that it be sealed and that its bacteria count be very low.

Cows from which this milk is produced are kept with the utmost sanitary care. The milk generally sells for a double price. It is used for infant feeding.

Powdered milk is also on the market. All the moisture in milk is evaporated and the solids are pulverized. Water must be added before it can be used. It is convenient both on account of its dry form and lesser bulk.

EXPERIMENTS

Tests for Butterfat and Protein

1. Put a drop of cream on paper. Put a drop of skim milk on paper. Compare appearance and draw conclusions as to the amount of fat present in each.
2. Heat ¼ c. of milk to scalding point.
3. Boil ¼ c. milk 2 minutes. Note the different appearance.
4. Test the temperatures with a thermometer.
5. Observe a bottle of milk and note the depth of cream at top. Good milk should have about 3 inches of cream on top.
6. Add ½ tsp. of vinegar to 1 tbsp. fresh milk. What does it do?
7. Soak a junket tablet in 2 tsp. warm water. Add this to ½ c. warm milk. What foodstuff is changed or affected? Compare the thickened part of milk in Experiments 6 and 7.

Effect of Heat on Milk.—Milk burns very easily on account of the fat it contains. The best way to heat milk is in a double boiler where the temperature is more moderate. When heated, bubbles begin to appear around the edges at about 160 degrees. This is called the scalding point. Scalding makes milk safer for use, as it kills many forms of germs. Boiling or scalding too long toughens the protein of milk and destroys the good effects of the vitamines and the best flavor.

We have found that both albumin and casein begin to thicken at 160 degrees and are toughened when subjected to a boiling temperature. Milk and egg dishes are best cooked at moderate temperature or below the boiling point.

Milk Combined with Egg.—When milk is combined with eggs in a cooked dish the eggs serve to thicken the milk and, if blended in the proper manner and subjected to a moderate temperature, a smooth, jelly-like texture results.

Custard is a cooked combination of milk and eggs.

If eggs are high in price, substitute in Standard Custard Rule for one or two eggs as follows:—

2 egg yolks may be used in place of 1 whole egg, or
1 tbsp. flour used for 1 egg omitted, or
½ tbsp. cornstarch used for 1 egg omitted.

QUESTIONS AND PROBLEMS

1. What does milk cost a quart?
2. Does the cost of milk change with seasons?
3. How much milk do you use in one day?
4. Why does standard custard rule say "four to six eggs" instead of a definite number?
5. How do you test baked custards?
6. What would happen to custard if the oven temperature got too hot?
7. What is junket?
8. What foodstuff forms in scum on top, when milk is boiled?
9. What is the difference between scalded milk and boiled milk?
10. Why is junket custard easily digested?
11. What foodstuff in milk is affected by rennin?

APPLICATION

1. Custards (Standard Rule)

2 c. scalded milk	¼ tsp. sugar
2 eggs (good size)	⅛ tsp. salt

1 tsp. vanilla or grating of nutmeg

The mixture is always combined in the same way. The only difference in Baked and Soft custard is in the manner of cooking.

Baked custards are baked in the oven. Soft custards are cooked in a double boiler.

VARIATIONS OF STANDARD CUSTARD RULE

Baked Custard

Method.—Beat the egg slightly, add the sugar, and then the scalded milk slowly. Add the flavoring and stir until the sugar is dissolved. Pour into cups or into one large baking dish, grate a little nutmeg on top, set the cups in a pan of hot water and bake in a moderate oven until a knife piercing it will come out clean. Do not allow the water in the pan to boil. Serve cold. Enough for 7 persons.

(*Basis for 2 girls, ¼ rule.*)

Soft Custard

Method.—Same recipe as for Baked Custard. Combine ingredients by same method, but cook in a double boiler. Stir constantly until the mixture forms a coating on the spoon. Remove instantly from the hot water; flavor, and cool.

(*Basis for 2 girls, ⅛ rule.*)

Caramel Custard

Use ½ c. sugar instead of ¼ c.

Method.—Melt the sugar to a light brown sirup in a saucepan over a hot fire. Add the scalded milk very gradually and cook until free from lumps. Pour gradually into the slightly-beaten eggs. Add the flavoring and bake as in Baked Custard.

(*Basis for 2 girls, ¼ rule.*)

Chocolate Custard

Add ½ square Baker's chocolate and 2 tbsp. water.

Method.—Melt the chocolate, add half of the water and half of the sugar, and cook until smooth. Add chocolate mixture to scalded milk and continue with the usual method for custards.

2. Custard Souffle′

2 tbsp. butter	1 c. milk
2 tbsp. flour	4 eggs
2 tbsp. sugar	Fresh or preserved fruit

Method.—Scald the milk in a double boiler. Stir the flour and the butter together, add the scalded milk gradually, and cook 5 minutes, stirring constantly. Beat the egg yolks and add the sugar; then add to the milk. Set the mixture away to cool. When cool, add the stiffly beaten whites of eggs, pour into a buttered baking dish, and bake 30 minutes. Serve at once. Fresh or preserved fruit may be added in a layer at the bottom of the dish and the custard souffle′ poured over it.

Tapioca may be used in place of the flour to make a pleasing change.

3. Junket

¾ c. milk	¼ junket tablet
1 tbsp. sugar	1 tsp. cold water
¼ tsp. vanilla	Pinch of salt

Method.—Dissolve the junket tablet in the cold water. Heat the milk until lukewarm, add the salt, sugar, vanilla, and the junket-mixture. Pour quickly into small molds, let stand in a warm place until firm, then chill before serving. Remove and serve with cream.

4. Caramel Junket

Method.—Caramelize 2 tbsp. of sugar and add 2 tbsp .of boiling water. Boil together until reduced to 1 tbsp. Use in place of vanilla for flavoring in the above rule.

HOME PROJECTS

1. Look up the milk standard and other laws in your city.
2. Find out whether you use pasteurized milk at home.
3. Make French Toast for one meal at home during the week.
4. Make one custard dessert during the week.

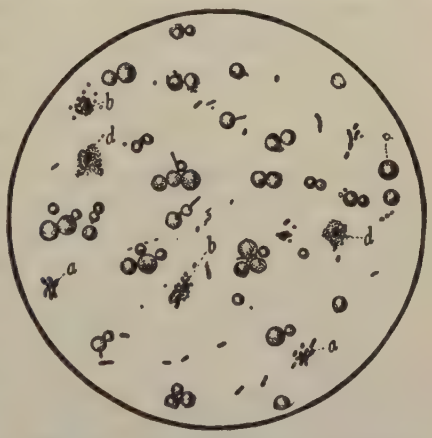
LESSON 8

MILK PRODUCTS

The chief products derived from milk are cream, butter, and cheese. These are important foods, and constitute a large portion of the world's diet.

CREAM

Separation of Fat.—The fat in milk, being lighter than the other substances, rises to the top when milk stands. This top fat is called cream. When cream is handled in quantities, the fat is separated by machinery which causes a revolving motion of the milk. This throws the fat particles together so that the cream is separated immediately from fresh milk without waiting for the fat to come to the top. When all the fat is removed, that portion of the milk which remains is called "skimmed milk."



Milk as shown under the microscope, showing numerous bacteria. *a*, common lactic bacteria; *b*, common cocci; *c*, fat globules; *d*, cells. *From Bacteria, Yeasts and Molds in the Home by Coun.*

Comparison of Skim Milk with Whole Milk.—Skim milk should sell for about half the price of whole milk, since all the cream has been removed. Skim milk contains all the protein (from 3% to 4%) and all the milk sugar (about 5%) that whole milk contains. It is thus a nutritious food and a comparatively cheap one. Skim milk may be used for soups, sauces, and cakes just as well as whole milk.

Standard Cream.—Cream is usually required by law to contain at least 20 per cent butterfat.

Cream contains much less protein, mineral salts, and sugar than whole milk. If, then, cream should cost 30 cents a pint and whole milk 10 cents a quart, the quantities of cream would be approximately equal in one pint of cream and three quarts of milk; but, if the milk were purchased, in addition to the cream, we should have nearly three quarts of skim milk which would contain considerable protein, sugar, and lime, which are valuable nutrients.

Whipping cream is best when it contains 25 per cent or more of fat and is from 12 to 24 hours old. Pasterurized cream and separator cream will whip readily, if it is at first kept cold, down to about 30° F., for about 2 hours.

If the cream contains too large a quantity of fat, it will separate when beaten or whipped and can not be used. Whipped cream is used to make desserts, for garnishes, and as an addition to salad dressing. It should be of thick, smooth consistency and cold when served.

To whip cream have it thoroughly cold. Beat it in a deep bowl with a double rotary egg beater until the cream thickens evenly. The fat spatters. Care should be taken to keep it in the bowl. To do so, cover the bowl tightly with a paper or cloth having a hole in the center for the handle of the egg beater.

BUTTER

Manufacture of Butter.—Butter is made from the fat of milk by the process of churning, which causes the fat globules to collect into granular masses. It is then washed to remove protein matter, which decomposes easily, and is salted to preserve it and give it flavor. It is then made into prints or packed into tubs for the market.

Butter may be made from either sweet or sour (ripened) cream. Sweet-cream butter has a very delicate flavor but poor keeping qualities, because it is not usually salted. The

ripening of the cream and the added salt give to butter a stronger flavor which is preferred by most persons and makes it better suited for marketing purposes. Nearly all the butter made in the United States is produced in well-regulated creameries.

The total amount of butter produced in the United States in 1921 is estimated to have been 1,705,438,000 pounds. The United States ranks fifth as a butter-eating country.

Composition of Butter.—Laws generally require that standard butter should contain not less that 80 per cent of butterfat, and not more than 16 per cent of water by weight. The butter-maker can make butter with little or much water as he chooses.

AVERAGE COMPOSITION OF GOOD BUTTER

Fat	Casein	Salt	Water	Vitamine
85%	1%	3%	11%	A

Food Value.—Butter is one of the most easily digested fats, and is very appetizing and healthful. It contains vitamine A in plentiful quantity.

Buttermilk is the part of the milk or cream that remains when the butter has been removed. It has very much the same composition and food value as skim milk, being a cheap and wholesome tissue-building food. The nutrients are very easily digested, and the acid is believed to exert a healthful influence in the body and is especially recommended to those suffering from stomach disturbances.

CHEESE

Cheese is the casein and fat of milk, drained, salted, pressed and cured. It is a means of putting milk, a bulky and perishable food, into concentrated form enabling it to be stored for future use and transported to distant markets.

There are many kinds of cheese manufactured, but in general they may be divided as hard and soft cheese, depending upon the quantity of water they contain. Examples of

hard cheese are New York and Swiss. Examples of soft cheese are Dutch and Roquefort.

Effect of Temperature on Cheese.—Cheese is almost a pure protein food. One pound of cheese contains nearly as much protein as 1 gallon of milk. For this reason all dishes containing cheese must be cooked at moderate temperature. Cheese by itself is cooked when melted. High temperature and long cooking make it tough and stringy.

USE OF MILK

Ways of Adding Milk to Meals.—The large amount of milk which each person should consume daily may be planned in several different ways. The best way is to serve milk in cream soups, cream sauces, cocoa, and in puddings. These dishes, being rich in food value, should form the basis of lunch or supper.

Thickening Milk.—When milk is used in soups or for a creamed dish, some thickening material must be used to bind the ingredients together and keep the solid part from separating from the milk. Flour, cornstarch, and eggs are binding materials. The eggs in custards serve that purpose.

The term sauce, as many of you may use it, means cooked fruit. In cooking however, we mean something entirely different. *Sauce* means milk with the thickening or binding material, plus a little fat, cooked together long enough to blend the starch with the flour. This is called White Sauce.

White Sauce may be thin, medium or thick, depending upon its intended use.

Thin White Sauce is used for cream soups.

Medium White Sauce is best for creamed vegetables, macaroni, and meats.

Thick White Sauce is used to hold croquettes together.

Proportions for White Sauces.—It is easier to have standard rules as much as possible in cooking, so that, in time of haste, excitement and complete separation from cooking text we may not be entirely "at sea." Many cook books

give different quantities of flour and fat for thin, medium, and thick white sauces; but the quantity of fat used need not be altered, since cream soups can have just as much fat as creamed vegetables or any other creamed dish. The only difference that is necessary in the three rules is the amount of binding material or flour. Thin White Sauce needs less flour and Thick White Sauce more flour than Medium White Sauce.

A simple Standard Rule for White Sauce is:—

Sauce	Flour	Fat	Milk	Seasoning
Thin	1 tbsp.	2 tbsp.	1 c.	½ tsp. salt, dash of pepper
Medium	2 tbsp.	2 tbsp.	1 c.	½ tsp. salt, dash of pepper
Thick	4 tbsp.	2 tbsp.	1 c.	½ tsp. salt, dash of pepper

and may be remembered as the "one, two and four" rule.

The only exception which might change the flour quantity would be, if the material used with White Sauce contained a great deal of starch. Example, macaroni. Then a little less flour might be used.

Ways of Making White Sauce.—There are two ways of adding the binding material to make White Sauce. If only a small quantity is made, Method No. 1 is best. Where more than 1 qt. is used Method No. 2 is better.

Method No. 1.—Melt the fat slowly in a saucepan, but be careful not to brown the fat, add the flour and seasoning, and stir until smooth. Add the milk slowly, stirring constantly until all is added and is perfectly smooth. Let it boil up once to thoroughly cook the starch in the flour. Then add seasoning.

Method No. 2.—Mix the flour with an equal quantity of cold water or milk until smooth, and then add enough more milk to make it pour easily. Heat the remainder of the milk in a double boiler, and when hot add the flour mixture gradually, stirring all the time until the mixture thickens. Add the fat and seasoning. This method takes longer (15 min.).

QUESTIONS AND PROBLEMS

1. What is meant by a moderate oven, as in the rule for cheese soufflé?
2. Name six foods which require moderate temperature in cooking.
3. How do you change the temperature for cooking?
4. Is there difference in temperature in different parts of the oven?

APPLICATION

1. Eggs a la Goldenrod

3 hard-boiled eggs	½ tsp. salt
2 tbsp. butter	⅛ tsp. pepper
2 tbsp. flour	5 slices toast
1 c. milk	Parsley

Method.—Melt butter, add flour, stir until smooth; add the milk slowly, stirring constantly; cook until smooth. Add salt and pepper. Separate yolks from whites of eggs. Chop whites fine and add them to the sauce. Cut 4 slices of toast in halves lengthwise, arrange on platter, and pour the sauce over them. Force the yolks through a strainer and sprinkle over the top. Garnish with parsley.

2. Dried Beef, White Sauce

¼ lb. dried beef sliced thin	2 tbsp. flour
1 c. milk	¼ tsp. salt
2 tbsp. butter	Speck of pepper

Method.—Remove the skin and separate dried beef in pieces, cover with hot water, let stand 10 minutes, and drain. Make a medium white sauce. Add beef to white sauce and heat. Serve on squares of hot toast.

(*Basis for 2 girls, ¼ rule.*)

3. Cottage Cheese

Method.—Place thick, freshly-soured milk or buttermilk over a pan of hot water, not boiling. When the milk is warm and the curd separates from the whey, drain in a cheesecloth and dry. Put the curd into a bowl and add salt, pepper, and cream to taste.

4. Cheese Souffle′

2 tbsp. butter	½ c. grated cheese
2 tbsp. flour	3 egg yolks
½ c. scalded milk	3 egg whites
½ tsp. salt	Cayenne

Method.—Make a white sauce of the first three ingredients. Add the salt, cayenne, cheese, and the well-beaten yolks. Cool the mixture and add the well-beaten whites by cutting and folding. Pour into a buttered baking dish and bake 20 minutes in a slow oven. Serve at once. Enough for 6 or 8 persons.

(*Basis for 2 girls, ⅓ rule.*)

5. Toasted Cheese Crackers

Method.—Put a thin layer of grated cheese on square salt crackers. Sprinkle with salt and a dash of cayenne pepper. Place the crackers on a shallow pan or baking sheet set in a hot oven until the cheese is

melted. Serve while hot. These are very nice to serve with afternoon tea or with a salad.

MEAL PLANNING

Plan Simple Supper Menus as Suggested for Next Lesson.

Go over the recipes in the lessons so far and make a list of at least ten dishes which are nice to serve as a basis for supper or Sunday night lunch. Select a fruit or dessert to go with each dish.

From this list decide what combination you wish to prepare next lesson with the cocoa for a little supper menu.

Girls work in groups of four and prepare a hot dish, a dessert, and a beverage.

The Following Are Suggested As Menus for Simple Suppers.

I	II
Creamed dried beef on toast	Creamy omelet
Apple sauce	Stewed rhubarb
Cocoa	Tea

HOME PROJECTS

1. Make Medium White Sauce twice during the week at home and use in some way.
2. Find out what cream costs a quart. If milk contains 3.25% butterfat and cream 20%, how much milk would you have to buy to get as much butterfat in equal quantities? Would it be better to buy the milk or the cream from the point of food value and cost?
3. Make cheese wafers to serve with a salad at lunch or supper.
4. Make cheese souffle′ for one meal at home during the week.

LESSON 9

WATER AND BEVERAGES

In a general sense, a beverage is any liquid that we drink either to quench thirst or for its refreshing and stimulating effects. More accurately, however, beverages are liquids artificially prepared for these purposes. Water and milk can, therefore, hardly be classed as beverages, although they may be similarly used.

WATER

Water ranks next to air as a supporter of life. A man can go many weeks without food, only a few days without water, and a few minutes without air.

Pure water is a clear, odorless, colorless, and almost tasteless liquid necessary for the sustenance and growth of animal and vegetable life.

Composition.—Chemically pure water is composed of two elements, oxygen and hydrogen in the proportion of one part oxygen and two parts hydrogen. The flavor of drinking water is due to the mineral salts and carbon dioxide gas contained in it.

Sources.—(1) Rain. (2) Surface water, as from rivers, brooks, lakes, ponds. (3) Ground water, as from wells, open and artesian, and some springs.

Uses.—Water enters into all plant and animal life and makes up about three fourths of the weight of the body. Water is used in the body:

1. To quench thirst.
2. To regulate the body processes.
3. To act as a solvent.
4. To act as a carrier.

By solvent we mean that it dissolves substances. Sugar and salt are easily dissolved in water. Water enters into the composition of the digestive juices and serves as an important

part in digestion by dissolving foods and making them available to the body. Water makes up a large percentage of the blood. The blood is the carrier which carries the absorbed food to all parts of the body. Water is also essential in the elimination of waste products.

Kinds.—There are three kinds of water (1) soft water, (2) hard water, and (3) mineral water.

The softness and hardness of water depends upon the quantity of minerals, principally calcium and magnesium which it contains. Some hard water can be softened by boiling and we speak of it as being temporary hard water. Water which can not be softened by boiling is called permanent hard water.

Mineral water is water containing a comparatively large percentage of certain minerals, such as soda, sulphur, lithia and iron. It is, therefore, hard also, but is so called because it contains other minerals than calcium and magnesium and is valuable for medicinal purposes.

Daily Requirement.—An average person requires about two quarts of water a day. This water is supplied by vegetables, meat, and other food, as well as by beverages.

Impure Water.—Water, being a solvent, dissolves many substances as it passes through the earth. Many of these are harmful to the body and some water carries disease germs. Impure water can not always be detected by color, taste, or smell. One should always know the source of water before using it. Water is contaminated in many ways, but the most common are:—

1. In open wells, by surface water and contaminating foreign substances.

2. By having water supply too close to outbuildings or sewage disposals. Water is purified more or less by filtering through the earth, but harmful bacteria are seldom removed, especially when the filtering distance is short.

3. By carelessness in diseases.

To Purify Water.—Water from springs and artesian and bored wells is usually pure.

1. Boiling will purify most water, but this destroys the flavor as well as the bacteria. Pouring boiled water from one jar to another partially restores its flavor.

2. Filtering water through stone filters is quite effective. The filters must be thoroughly cleaned frequently or they will be worse than none. In city systems water is often filtered through large sand beds or treated with chlorine. Small cloth filters fastened on the faucets *do not* purify the water.

Effect of Temperature on Water.—Water freezes at 32° F. (which is zero on the Centigrade scale).

Water simmers at 185° F.

Water boils at 212° F., or 100° C.

When water reaches the simmering point, it shows tiny bubbles forming beneath the surface. When water reaches the boiling point, the bubbles come to the top and steam arises. More rapid boiling does not increase the temperature of the water. It is a waste of gas (if gas is used for cooking) to have burners turned higher than is necessary to keep water just boiling.

COCOA AND CHOCOLATE

Cocoa is a very good beverage for children, since it offers one way of placing milk in their meals.

Source.—Cocoa and chocolate are products from the seeds of the cocoa plant, which is grown chiefly in the tropical countries of America.

Manufacture.—The bean pod is from 7 to 10 inches long and 3 or 4 inches in diameter. Each pod contains 20 to 40 seeds. They are fermented in heaps on the ground for several days, to develop their flavor; then the beans are dried and roasted, the covering is removed, and they are sold as "cocoa nibs." Some of the fat is extracted from cocoa nibs, and the

rest of the bean, pulverized and mixed with sugar and a little starch, is sold as cocoa.

Chocolate is made from ground whole cocoa nibs without having any of the fat removed. Some is sweetened and flavored and pressed into cakes and sold as sweet chocolate. Bitter chocolate is molded into cakes without being sweetened and is most used for cooking.

The fat obtained from the cocoa bean is sold as cocoa butter, and is used for medicinal and other purposes.

Composition.—The cocoa bean contains nearly 50 per cent fat and 10 to 15 per cent starch, with a little protein. It contains a substance called *theobromine*, which is similar to *caffeine*, but is much milder.

Food Value.—The fat and protein in cocoa and chocolate combined with the milk used in the preparations make them both nutritious foods. Chocolate is richer in fat and harder to digest than cocoa. Cocoa makes a nourishing drink for children and invalids. Both have a slightly stimulating effect on the body.

Uses.—In 1921, 306,568,000 pounds of crude and prepared cocoa and chocolate were imported. These are used principally for beverages and candy.

Effect of Cooking.—On account of the presence of starch a high temperature is best for cooking cocoa and chocolate. Neither cocoa nor chocolate are soluble in water. Some brands of cocoa are especially prepared and claim to be soluble cocoa. In most cases, however, cocoa, when made into a beverage with water or milk, will separate if allowed to stand a few minutes. Cocoa is better flavored if boiled a few minutes.

Chocolate must be treated with boiling water and cooked slowly a few minutes until a smooth paste is formed before adding other ingredients. When cooked too long, the fat separates and floats on the top of the beverage. When chocolate is served with whipped cream it makes a dish

very rich in fat. Two dishes rich in fat should not be served at the same meal.

COFFEE

Coffee is one of our most common table beverages.

Source.—Coffee is made from the berries of a tropical evergreen grown principally in Brazil, Arabia, Java, Ceylon, and East India. About three fourths of the world's coffee comes from Brazil. Each berry has two seeds.

Kinds.—Coffee grown in Arabia (Mocha coffee) is of fine quality, and is a small, dark-yellow, round berry. Java and East India coffees are pale yellow before roasting. Ceylon and Brazilian coffees are a green gray. A combination of Mocha and Java makes an excellent coffee. Genuine Mocha and Java are scarce and very expensive. Substitutes are often sold under these names.

The flavor of coffee is not always the same in the same kinds of coffee. Flavor is due to many factors among which are variety of the tree, climate, the age of the coffee berries, the roasting process, and the blending of varieties.

Adulteration.—Coffee is often adulterated with roasted chicory, acorns, and parsnip roots. Good coffee does not sink in cold water nor quickly discolor cold water.

Composition.—Coffee contains a stimulating substance called *caffeine*, which is the same thing as *theine* in tea. It also contains some essential oils and tannin.

Food Value.—Coffee itself has no food value. It stimulates the nerves, brain and heart, and the tannin has a hindering effect on digestion. Because it is usually made stronger, it has a greater stimulating effect than tea. For most persons, good coffee taken moderately at the close of a meal has a beneficial effect. Children should avoid coffee, as well as tea; they need no stimulants.

Use.—Coffee is, no doubt, used more than any other beverage. In 1921, 1,340,980,000 pounds was imported into the United States.

Care of Coffee.—1. Buy good, freshly roasted coffee, unground, and grind it as it is needed.

2. Keep it in an air-tight jar.
3. Never let it stand in the pot between meals.
4. Use a clean coffeepot, and scald after using.
5. Do not use soap in washing out the coffeepot.

Coffee As a Beverage.—Coffee as a beverage is made by boiling ground coffee with fresh water only long enough to extract the first rich flavor. Long boiling extracts tannic

Service for hot beverage as served by hostess at table.

acid which makes the beverage bitter. The volatile oils in coffee are a fleeting substance imparting some of the flavor to the beverage. Boiling a minute or two increases the flavor, but this is soon lost with continued boiling. These volatile oils are held in the coffee berries; but, when coffee is ground and exposed to the air, much of their aroma passes off. For this reason many persons prefer to buy the whole berries and grind their coffee as needed.

Ground coffee, when purchased, should be kept in tightly closed jars.

Use of Egg White in Coffee.—One egg white will clear 6 to 8 cups of coffee. Whip the white slightly to make it blend more evenly with the ground coffee. Clean egg shells having any of the white adhering to them may be used to serve the same purpose.

TEA

Tea is the social drink *par excellence.*

Source.—Tea is the dried leaves of a shrub grown extensively in Japan, China, India, and Ceylon. Different qualities of strength and flavor in tea are due chiefly to the age of the leaves when picked and to the method of curing them. The young and tender leaves and buds yield teas of the highest quality. There is a great difference in the flavor of tea grown in different countries.

Tea plant, showing parts to be plucked for the better grades of tea. (U. S. D. A. Bul.)

Kinds and Manufacture.—There are two kinds of tea, green and black, with many varieties or brands of each.

Black tea is made by first allowing the leaves to wilt rather slowly, after which they are rolled, allowed to ferment and turn black, and then dried in an oven. Examples of black tea are Pekoe, Oolong, and English Breakfast.

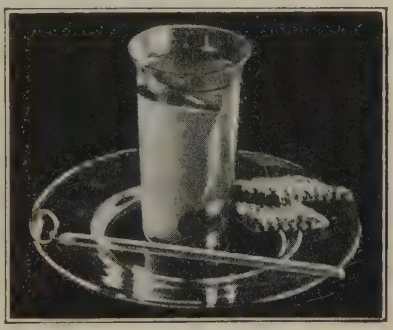
Green tea is made in a similar way to black tea, except that the curing process is done more rapidly and the leaves are first wilted at a temperature high enough to kill the fermenting agents, thus preserving the green color. Hyson and Gunpowder are two common commercial varieties of green tea.

Composition.—The most important substances in tea are

theine, a stimulant; *tannin*, a harmful astringent; and a small amount of volatile oils, which give flavor and aroma. Black tea is milder than green tea.

Food Value.—Tea itself has no food value. It is used for its mild stimulating effect upon the nervous system and because it removes the sense of fatigue. Poor tea or tea taken in excess produces a hindering effect on digestion and with many persons causes irritation and sleeplessness. Children require no stimulants, and their health is best promoted without tea.

Use.—In 1921, 76,487,000 pounds of tea was imported. You will notice that this was about half as much as the coffee imported. Tea is a conventional beverage for afternoon parties, often called "teas."



An individual service for lemonade.

Adulterations.—Cheap grades of tea are likely to be adulterated with tea dust, and injurious substitutes are sometimes used and colored to imitate a real green tea.

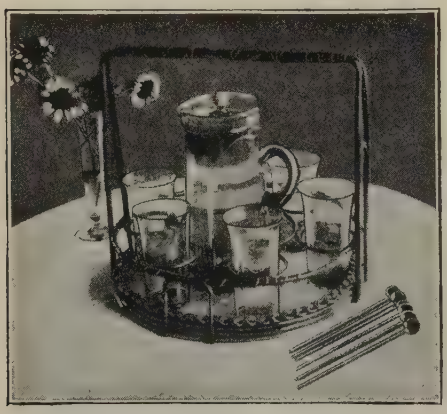
To Make Tea.—Tea, unlike coffee, does not require boiling and is in fact ruined by boiling. The flavor in tea is due to the substance called *theine*. Water that is boiling when poured over the tea leaves and allowed to stand a minute or two extracts this flavor. Boiling the tea or too long steeping draws out the tannin, which is undesirable.

Proportions for tea:—Allow 1 tsp. tea to 1 c. of boiling water.

A tea ball for holding tea leaves is a convenience in making tea. When the strength of the tea is right, the ball may be removed and there is no danger that the beverage will be

steeped too long. Additional water added to the pot and tea ball makes a second serving of the same strength as the first.

Ice tea, to be good, requires about twice as much tea to a cup of water as hot tea, since the ice added serves to dilute the beverage. Iced tea is made several hours before serving time and set away to be cold, then served with ice. Hot tea may be served at the table from the pot, the tea being poured directly over the cracked ice in the glass. Many prefer it this way, since the flavor seems to be better. The only difficulty arises from using so much ice when served this way.



A service for cold fruit beverages.

A slice or an eighth section of lemon is served with each glass of iced tea and, if one likes mint, a sprig of it may be served with each glass.

FRUIT JUICES

Many beverages, especially for social functions, are made of fruit juices either singly or in combination. Lemonade, orangeade, grape juice, pineapple juice, and lime juice or combinations of these in punch are tasty and refreshing. These drinks are generally served in glasses at home but in glass cups from a bowl on social occasions.

The cold fruit beverages are of great value in the hot weather as aids in reducing the body temperature. They should be sipped slowly, however, since too rapid drinking of iced cold beverages frequently causes severe gastric disturbances.

QUESTIONS AND PROBLEMS

1. Where do you get the drinking water in your home?
2. Why is it necessary to use great precaution in drinking water from open wells, little streams, pools?
3. Why are eggs used to settle coffee? Are the yolks used?
4. What could you serve with chocolate that would not be too rich?
5. Why do you scald the teapot in making tea?
6. How often do you drink cocoa at home? Is is nutritious?
7. Why is coffee harmful to growing boys and girls?
8. Why should coffee be kept air-tight?

APPLICATION

1. Cocoa

1 pt. scalded milk	2 tbsp. cocoa
1 pt. boiling water	2 to 4 tbsp. sugar

Method.—Mix cocoa and sugar in a saucepan, stir in the water gradually, and boil 5 minutes. Add the milk, and cook 5 minutes longer or until smooth.

2. Chocolate

1 sq. Baker's chocolate	Pinch of salt
2 tbsp. sugar	1 qt. hot milk
2 tbsp. hot water	

Method.—Put chocolate, sugar, salt, and 2 tablespoonfuls of hot water in a pan. Cook until smooth, stirring constantly and gradually adding the hot milk. Boil for several minutes. Serve with whipped cream or a marshmallow on the top of each cup.

(*Basis for 2 girls, ¼ rule.*)

COFFEE

Proportions of Coffee for a Beverage:—

Use 1 r. tbsp. coffee for each person. Add 1 tbsp. for the pot.

Use as many cups of water as tablespoonfuls of coffee.

Example:—For four persons use 5 r. tbsp. coffee and 5 c. water.

Coffee for a Large Number:—

1 pound of coffee will make coffee for 30 persons.

3 egg whites or two whole eggs will clear 1 pound of coffee.

3. Boiled Coffee. (Using Boiling Water)

Method.—Mix coffee with the egg and add enough cold water to wet the coffee. Add the boiling water and boil several minutes. The time depending upon the quantity being made. A large quantity requires 10 to 15 minutes. Remove pot to warm part of the stove to keep it hot and let stand to settle. Pour out a little coffee and return to the pot,

to remove the grounds from the spout. A little cold water added to the coffee in the pot aids in settling coffee.

4. Boiled Coffee (Using Cold Water)

Method.—Mix coffee and egg and add water for the full amount to be used. Put the pot over the fire and bring all to a boil. Boil only a minute or two. Then treat the same as when prepared with boiling water. This method is simple and generally used for making coffee in large quantities and on picnics.

5. Filtered Coffee

A larger quantity of coffee is required for each cup when coffee is filtered. The proportion is

½ c. coffee to 4 c. boiling water.

Water must be boiling.

6. Tea

3 tsp. tea	3 c. water

Method.—Put the tea into a scalded earthen or china teapot and pour the freshly boiled water over it. Moderately hard water is best. Cover and allow to steep 3 to 5 minutes. Serve with sugar and cream, if desired, or with sugar, a clove, and a thin slice of lemon. Tea should always be freshly made and should never be boiled.

7. Lemonade

1 lemon (juice)	½ c. sugar
1 pt. water	2 thin slices of lemon

Method.—Wash the lemon, cut thin slices from the center, and remove the seeds. Squeeze the juice into a bowl, add the sugar, water, and cracked ice. Serve very cold with a slice of lemon for each glass.

NOTE.—Variations of this lemonade may be made by adding fruit juices or mineral or aerated water.

MEAL PLANNING

Prepare the little suppers in groups. Have recipes ready and work without any help.

HOME PROJECTS

1. Compile list of commercial coffees with prices of each.
2. Compile list of commercial teas with prices of each.
3. Look up the manufacture of tea and coffee.
4. Make cocoa for the children in the family for two meals during the coming week.
5. Make chocolate for all the family for supper on Sunday evening.
6. Prepare one other dish to go with the supper on Sunday evening.

LESSON 10

SUGAR—CANDY

Sugar is a sweet crystalline substance belonging to the energy-giving class of foods. It is soluble in water, and readily digested in the body.

Sources.—Sugar is obtained commercially from the sugar cane, sugar beets, and the sugar maple tree.

Kinds.—The principal kinds of sugar are:—

Cane sugar, or *sucrose*, obtained from sugar cane, beets, and the sugar maple tree.

Grape sugar, or *glucose*, found in grapes, in dried fruits, like raisins and dates, and in honey. Commercial glucose is made from cornstarch by boiling with an acid. Glucose is not as sweet as cane sugar.

Honey is a natural sirup made up chiefly of a mixture of sugars and water.

Milk sugar, or *lactose*, obtained from milk.

Sugar Cane.—Sugar cane is a tropical plant similar to corn and grows to a height of from 8 to 15 feet. The stalk is spongy like corn and is filled with sweet sap. When ripe, the cane is stripped of leaves and tops and is cut and taken to the mill, where the juice is pressed out.

Sugar Beets.—Sugar beets are profitably grown in many states. About half of the world's supply of sugar is made from beets. There is no difference between beet and cane sugars.

Manufacture of Sugar.—The sweet juice is extracted by crushing the cane or beets between rollers. The juice is purified and then evaporated down to a sirup by heating in vacuum pans. The sugar crystallizes out from the sirup and is removed by centrifugal means. What does not crystallize remains as molasses. Molasses from sugar beets is not used for the table; no way has been found to purify

it. Brown sugar is raw, unrefined sugar. In certain methods of manufacture, it is redissolved, passed through filters of lamp black to remove the color, and then recrystallized.

A new process* has been worked out for making a sugar 50 per cent sweeter than cane sugar and cheaper to produce. Certain vegetables, notably artichoke, contain, instead of starch, a near relative named *inulin*, which breaks down into *levulose* instead of *dextrine*. Artichokes can be grown almost anywhere and with less labor and expense than beets. This sugar, it is said, is undistinguishable from cane sugar and is equally wholesome.

Forms of Sugar.—The crytals of sugar as separated from the sirup and dried form *granulated* sugar. When the thick sirup is run into molds, it hardens and forms *loaf* sugar, which may be sawed into cubes. The broken pieces ground fine become *powdered* sugar.

Production.—In 1923, the world production of sugar was nearly 44 billion pounds.

Food Value of Sugar.—Sugar in moderate quantity has the same food value that starch has, but is in an easier form for digestion. For this reason it is of value to persons who have difficulty in digesting starch. Being readily soluble, it is very good in times of great exertion or labor, when the body demands an immediate supply of energy. If taken in excess or between meals, it is very likely to cause indigestion or to spoil the appetite for more necessary nutritious foods.

A person who has the habit of eating much candy, using much sugar with his cereals or eating an excess of sweets along with a good substantial diet, is likely to put on fat and increase his weight. To eat more sugar than is required by the body to meet its energy requirement simply means that the extra amount has to be stored in the body some place. The body store room for extra sugar material is fatty tissue. When a person is too fat and wishes to reduce

* Sugar Laboratory, U. S. Bureau of Standards.

weight, he should stop eating all sugar foods together with the starches for a time and the body will have to draw on its storehouse of fat.

Sugar relieves fatigue, and has been found to sustain athletes in prolonged and strenuous contests.

Candy is almost pure concentrated sugar, some, however, containing more water and a little starch and flour. When eaten in undue quantity or between meals, it is likely to disturb digestion, but is a useful food when a small portion is taken at the proper time. When a meal is lacking in sweet foods, a little candy eaten at the close of the meal will take the place of dessert. Children should not eat much sugar or candy, as it destroys their appetite for better foods.

Homemade candy is usually cheaper and purer than that bought in many stores. Impure sugar and unwholesome coloring matter are too often used in the manufacture of commercial candies.

Effects of Heat on Sugar.—Sugar undergoes several changes during the process of cooking. The terms "soft ball," "hard ball," "thread," "the crack," or "brittle," and "caramel" are used in making candy to distinguish the different temperatures and changes.

1. *Thread* is the test when the sugar spins a thread when dropped from a spoon.

2. *Soft ball* is the degree of heat in sugar when a little dropped into cold water and then rolled in the fingers forms a soft ball.

3. *Hard ball* is the degree when sugar similarly tested makes a hard ball in the fingers.

4. *The crack*, or brittle, stage is reached when the sugar immediately hardens and crackles when dropped into cold water.

5. *Caramel* is the stage at which the heat causes the sugar to turn brown.

Utensils for candy-making are:—

A large agate or iron kettle, as sugar burns very easily.
A wooden spoon or paddle for mixing.
Buttered tins or a marble slab for cooling.
A candy thermometer.

EXPERIMENTS

Solubility and Granulation of Sugar

1. Add 1 tsp. of sugar to ¼ c. cold water.
2. Add 1 tsp. of sugar to ¼ c. boiling water.
   Which dissolves the more readily?
3. Boil ½ c. sugar with ½ c. water. Test it for thread, soft-ball, and crack stage. Note the crystals around the edge of pan.

Temperature Test For Cooking Sugar

Thread stage is 230° F.	Crack, or brittle, stage is 290° F.
Soft-ball stage is 236° F.	Caramel stage is 350° F.
Hard-ball stage is 254° F.	

In boiling sugar with water or a liquid some of the water is evaporated. Whenever enough liquid is evaporated the sugar crystallizes, or granulates. A large quantity of liquid requires longer cooking. Too long cooking makes sirups and candy granulate. Too little cooking makes them sticky.

Sirups for frostings and candies should not be stirred while cooking or crystals will form. Glucose or acid in sugar mixtures prevent them from crystallizing. The cane sugar, when heated with an acid, is partly changed to glucose, which does not form the large crystals. Cream of tartar is the acid most frequently used in candy-making.

Corn sirup, which is largely glucose, when used with sugar, prevents crystallization just as pure glucose.

Beating candy before it is cold will make the mixture more granular than if the mixture is first allowed to get cold.

QUESTIONS AND PROBLEMS

1. What is the effect of sugar in the diet?
2. Is there a difference between cane and beet sugars?
3. Name two candies where soft-ball stage test is used.
4. Name one place where thread-stage test is used.
5. Is slow cooking or fast boiling best in making candy? Why?

APPLICATION

1. Peanut Brittle

2 c. sugar
1 c. chopped peanuts
Pinch of salt

Method.—Melt the sugar without water in a frying pan. Stir with a wooden spoon constantly, until clear and a light brown; then pour over the peanuts spread on a buttered pan. While still warm cut into squares.

(*Basis for* 2 *girls,* ¼ *rule.*)

2. Chocolate Fudge

2 c. sugar
1 c. milk
1 tbsp. butter
½ tsp. vanilla
2 squares chocolate

Method.—Cook the sugar, milk, and chocolate in a pan, stirring constantly, until a little forms a soft ball when tried in cold water. Add the butter, and remove from the fire. Let stand until cold; then add the vanilla and beat hard until it begins to thicken and can be kneaded between the hands like dough. Knead until smooth all through.

Spread 1 inch thick on a buttered pan; cool and cut in 1½ inch squares. Chocolate Nut Fudge is made by adding ½ cup of walnuts or pecans, cut in small pieces, to Chocolate Fudge just before beating it.

(*Basis for* 2 *girls,* ½ *rule.*)

3. Pop Corn Balls

1 c. corn sirup
½ c. sugar
1 tsp. cream of tartar
2 tbsp. butter
1 tbsp. butter
¼ tsp. soda
4 qts. popped corn

Method.—Boil the sirup, sugar, and cream of tartar to the soft-ball stage. Then add the butter and soda. Pour over the freshly popped corn, cool, and shape into 15 balls.

4. Pulled Taffy

2 c. sugar
½ c. vinegar
3 tbsp. butter
1 c. water
1 tsp. vanilla
½ tsp. lemon extract

Method.—Boil sugar, butter, water, and vinegar until a little forms a hard ball in cold water. *Do not stir.* Flavor, pour on buttered platter, and pull as soon as possible.

(*Basis for* 2 *girls,* ½ *rule.*)

5. Sea Foam

2 c. sugar	Whites of 2 eggs
¾ c. boiling water	¾ c. chopped nuts
½ c. corn sirup	½ tsp. vanilla

Method.—Boil the sugar, water and the sirup until a hard ball can be formed in cold water or until it spins a four-inch thread. Pour the sirup slowly into the stiffly beaten whites of eggs. Then add the nuts. Beat until creamy, add the vanilla and pour into an oiled pan to cool. Mark in squares. Candied cherries may be added in place of or in addition to the nuts to make variety.

HOME PROJECTS

1. Look up story of sugar cane and sugar beets.
2. Visit a sugar refinery if possible.
3. Take special care of personal appearance, dress, hair, and hands when doing any cooking at home.
4. Make a pound of fudge and compare it in cost with that purchased in stores.

SUGGESTIONS FOR CHRISTMAS SALE

Make candy for a candy sale and pack neatly in boxes.

Make candy for a sale just before the holiday vacation. Discuss packing candy and kinds of boxes to use. Take orders for candy and ascertain approximately how many kinds will be on sale and the number of pounds to be contributed. Keep accurate account of the cost of each candy made and fix price accordingly.

LESSON 11

FOOD CLASSIFICATION

Breakfast Menus

Definition of Foods.—Foods are substances which when taken into the body promote the growth and replace waste, give energy for muscular activity, and heat, and also regulate the body processes.

The human body is in reality a wonderfully constructed machine. As the engine of the automobile burns gasoline for fuel, so the body burns food for fuel. Machinery wears out in time and needs a replacement of parts. The body is constantly wearing out and uses its food to build and replace its worn-out parts or tissues. The automobile engine, in order to run noiselessly and smoothly, needs plenty of lubricating substance. Oil is used for this purpose. The body requires lubricating, also, and some foods serve as lubricants or regulators of body processes. The automobile may be supplied with plenty of gasoline and oil but without a battery or some means to furnish a spark for igniting the fuel it can not be started. The human body, likewise, may be supplied with ample fuel for building, repair, and energy needs, and yet becomes totally unfit for service unless certain protective foods are used to furnish the vital spark and promote the health of the body.

Food may be classified according to its function in the body as follows:

I. Heat and energy foods, which include—
   (1) Carbohydrates
      (a) Sugar
      (b) Starch
   (2) Fats
   (3) Proteins

II. The tissue-building foods, which include—
  (1) Proteins
    (a) Complete
    (b) Incomplete
  (2) Mineral salts
  (3) Water

III. Regulating foods, which include—
  (1) Mineral salts
  (2) Water

IV. Protective foods, which include—
  (1) Mineral salts
  (2) Vitamines
    A. (Fat soluble A)
    B. (Water soluble B)
    C. (Water soluble C)
    D. (Undetermined)

Cellulose is not a food, but is classed with the carbohydrates, since it contains the fiber of fruits and vegetables.

Chemically, foods are classified as organic or inorganic.

I. Organic foods (those of animal and vegetable origin).
  (1) Nitrogenous (those containing nitrogen)
    (a) Proteins
  (2) Non-nitrogenous (those without nitrogen)
    (a) Carbohydrates
    (b) Fats
    (c) Organic salts

II. Inorganic foods.
  (1) (a) Mineral salts
  (2) (b) Water

The chemcial composition of vitamines is unknown. They can not, therefore, be classified at present.

Foods which perform the same function in the body differ in many ways. There are thus subdivisions of each class of food. Carbohydrates, fats, and proteins all serve as heat and energy foods.

Heat and Energy Foods.—These are the body fuels.

Carbohydrates are foodstuffs made up of the elements, carbon, hydrogen, and oxygen. They are produced in plant life on a large scale, and include the sugars and starch. Milk sugar is one exception. Cellulose, which is a part of all plant life, is not a food, and can not rightfully be classed as such, although it was formerly classed as a carbohydrate.

Fats are composed of the same elements as carbohydrates, namely, carbon, hydrogen, and oxygen. The proportion of carbon is much greater, for which reason they give about twice as much energy as carbohydrates. The fats produced by plant life are in the form of oil. If more carbohydrate and fat are eaten than can be consumed at the time, the body stores them as fatty tissue.

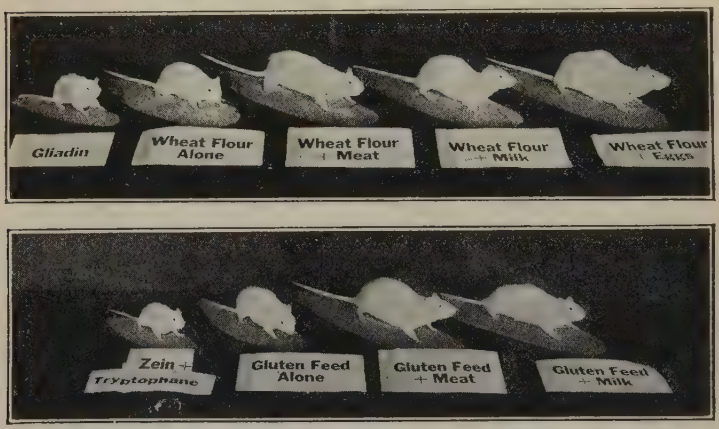
Proteins contain carbon, oxygen, hydrogen, and in addition, sulphur and nitrogen. Some proteins also contain phosphorus or iron. Proteins are able to serve both as energy foods and as tissue builders. If carbohydrates and fats are eaten in less quantity than is required by the body to furnish its energy, the proteins in the food are used to serve that purpose. If proteins of sufficient quantity are not present in the food supply, then the body draws upon its own tissues to produce its energy. If more protein is eaten than is needed by the body, it is discarded as waste material.

Tissue-Building Foods.—These supply the body with material to repair the constant waste.

Proteins.—Because they contain nitrogen, proteins build and repair tissues, and are called nitrogeneous or tissue-building foods. Plants can build their own protein from inorganic substances in the air and soil. Animals can not use inorganic substances for this purpose. The protein of animal bodies, as contained in the muscles, blood, and other tissues, can be built up only from the digestion products of their protein food. The proteins are made up of simpler substances containing nitrogen and called "amino acids."

These are the final form in the breaking down or digestion of proteins. Proteins from different sources of plant or animal life, and also protein from different tissues are not identical substances, but are all very complex.

There are eighteen kinds of amino acids. Some proteins contain a few, others several different kinds of amino acids, in varying quantities, which fact accounts for their difference in their tissue-building abilities. Protein as protein is not sufficient. It must contain the necessary amino acids.



An illustration of the comparative value of cereal product mixtures respectively, unsupplemented or supplemented with regard to the quality of the protein supplied.—*From "Nutrition," by L. B. Mendel.*

The complete proteins are those which contain all the amino acids necessary for promoting growth in the young, and maintaining the body weight in the full grown animal. Milk, eggs, meat, and cheese contain complete proteins.

The incomplete proteins are those which are lacking in some of the amino acids necessary for growth, and contain only those which will maintain life. Grains, gelatin, and some legumes are incomplete proteins.

Mineral Salts.—The skeleton, or framework of the body,

requires building materials which protein foods can not furnish. These materials are furnished by the mineral salts.

Mineral salts are used in the body to

1. Build bony tissue.
2. Help build muscle, blood, and body fluids.
3. Aid in regulating the body.

The principal mineral salts are iron, calcium, and phosphorus. Others are sodium, sulphur, potassium, chlorine, magnesium, and iodine. There are sixteen in all.

The various necessary mineral elements are obtained mostly from fruits, vegetables, and grains, especially from those fruits and vegetables that are acid. Besides their need in the composition of the body, they assist much in regulating the natural functions and have protective value in maintaining some of the vital processes.

No one food is capable of furnishing all the foodstuffs rich in minerals. Different foods, therefore, which are rich in minerals must be used in the meals each day, and be so prepared that the minerals are available to the body.

Iron is used in the red corpuscles of the blood and all the body fluids. The best sources of iron are egg yolk, green vegetables (especially spinach), whole cereals, lean meat, and legumes.

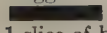
Calcium is used in building bones and teeth. The best source of calcium is milk. Other sources are whole grains, vegetables, legumes, and fruits.

Relative Quantities of Calcium (Lime) in Four Common Foods

1 cup of milk

1 cup of carrots

1 egg



1 slice of bread

Phosphorus is important in the building of nerves, brain cells, muscles, as well as bones and teeth. The chief

sources of phosphorus are milk, egg yolk, legumes, whole cereals, leafy vegetables, fruits, and lean meat.

Iodine is found in the thyroid gland and has vital connection with the activity of that organ. This element must, therefore, be available in food, although only in the minute quantity of one two hundredths of a grain daily. Somewhat like vitamines, iodine is necessary in some of the life processes. Lack of it is believed to cause goiter and other serious diseases.

Iodine is commonly found in the soil and is taken up by some plants, which, when used as food, maintain a sufficient supply for this gland. In certain sections, however, as in the states bordering the Great Lakes, iodine is lacking in the soil and hence also in crops raised from it. When not found in vegetation, it may be gotten from such foods as eggs, oysters, sea moss, and sea fish.

A table salt containing a very small but sufficient quantity of iodine is on the market and furnishes an adequate substitute for those persons in whose diet it is lacking.

Some of the large cities in the North Central states are planning to put iodine into the reservoirs that supply the homes with water.

In a large school system it was found that as high as 95 per cent of the pupils were afflicted with goiter. After fifteen months' treatment with iodine this percentage was reduced to 28.

Vegetables That Contain Iodine When Available

Asparagus	Carrots	Parsley	Radishes
Beans	Garlic	Peas	Tomatoes
Beets	Lettuce	Pineapple	Turnips
Cabbage	Melons	Potatoes	Water cress

Water constitutes a large portion of the body (see Lesson 9), is a carrier for the nutrient elements of the blood, a solvent, a necessary medium in elimination of waste, and tends to reduce body temperature.

Regulating Foods.—These consist of mineral salts and water and have been treated under tissue-building foods.

Protective Foods.—These include mineral salts (see previous paragraphs) and vitamines.

Vitamines compose an important class of substances which must be included in our meals if our food is to serve its best purpose. Just as sunshine is necessary to the young plant to promote its growth and best development, so vitamines are necessary to promote growth and good health in animal life. Foods containing vitamines may be called

Showing the effects of diets rich and poor in vitamine B. Age and environment the same, but foods different.—*From "Nutrition," by L. B. Mendel.—Experiment by Nutrition Laboratory, Battle Creek Sanitarium.*

protective foods. There are different kinds of vitamines as well as different kinds of carbohydrates and proteins.

At present there are four known classes of vitamines and it is thought that still others remain to be discovered. The four classes are as follows:

Vitamine A (fat soluble A) Vitamine C (water soluble C)
Vitamine B (water soluble B) Vitamine D (undetermined)

Vitamine A is found in green vegetables, egg yolk, and butter. It is not greatly affected by heat. Without this kind of vitamine children are likely to be underdeveloped, dull and sickly and to have eye diseases and rickets.

Vitamine B is found in green vegetables, fruit juices (especially oranges), and whole cereals. Lack of it causes loss of appetite, malnutrition, and a disease called beri-beri.

Vitamine C is found in uncooked green vegetables, fresh fruits (especially oranges and lemons), and milk. Lack of it causes scurvy and skin diseases. Heat destroys this vitamine. Hence, when milk is pasteurized, it should be supplemented with orange juice or some other source of this vitamine.

Foods rich in vitamines, including spinach, lettuce, cauliflower, butter, milk, cream, carrots, yeast, liver, egg yolks, prunes, nuts, oranges, tomatoes, sweet potatoes, cucumbers, and whole grains.

Vitamine D has just recently been isolated and found to be the growth-promoting substance in yeast. It is also found in wheat, oranges, lemons, unpolished rice, corn, and many of the same foods in which vitamine B exists. Its exact nature and full food value are not yet determined.

Some scientists think that meat protein contains a new vitamine which performs an important part in nutrition, but the existence of which has not been definitely established.

Other scientists claim that foods deficient in growth-promoting substances become sufficient when subjected to direct sunlight for several hours.

Foods Richest in the Various Vitamines

Vitamine A	*Vitamine B*	*Vitamine C*	*Vitamine D*
Milk	Orange juice	Milk	Yeast
Egg (yolk)	Fresh vegetables	Green vegetables	Wheat
Butter	Whole cereals	Fresh fruits	Oranges
Green vegetables	Tomatoes		Lemons
Codliver oil	Nuts		Rice, unpolished
Liver	Liver		Liver
Kidneys	Heart		
	Sweetbreads		

In grouping foods to form a meal one must keep a good proportion of carbohydrates, fats, and proteins, together with the protective and regulating foods. Meals must also include some foods containing cellulose and bulk.

Breakfast Menus.—Breakfast, as a rule, contains more fruit, cereal, and bread than any other meal. The protein is increased according to the activity of the individuals.

The fruit may be fresh, canned, or stewed dried fruit. Fresh fruit may be replaced in winter by canned or dried.

The cereals may be either cooked or the prepared varieties. The cooked cereals, requiring long slow cooking, such as rolled oats, Cream of Wheat, and hominy, are preferable in the heavy diets and furnish heat and energy food for cold weather, and are the best cereal foods for children.

Eggs are best served poached, soft-cooked, or in an omelet for breakfast and are a protein of first importance.

Breakfast meats consist of bacon, sausage, creamed fish, and liver. Meat and meat substitutes are not used in a light breakfast for persons of sedentary habits, but are necessary in the diet of the active worker where a hearty breakfast should always be eaten.

Breakfast breads are more varied than the bread at any other meal. For the light diet simple toast is best. The hot breads are more difficult of digestion and pancakes and doughnuts should be avoided.

The active worker, however, may use them quite often.

Children should never be allowed hot breads. Toast is best made from bread two days old. Corn breads are the most difficult hot bread to digest, and, unless some wheat flour is used, are very rich in fat.

Breads made from the whole grains are especially recommended as the most healthful and economical. They contain more roughage, mineral salts, and vitamines.

Beverages for breakfast include milk, cocoa, and coffee. Milk and cocoa are especially valuable. Tea and coffee should be served only to adults. They have no value as food except what the cream and sugar may contain.

Going without breakfast is a bad habit and one which no one can afford to form without a doctor's advice. The body requires some food after its long rest during the night. If any meal is omitted, it had better be the one at noon.

Growing children and boys and girls of school age should always eat some breakfast. One of fruit, cereal, and milk or cocoa is best.

For convenience in discussing breakfast menus, they have been classified in four different types. Each type represents a very definite kind of meal. Type I is very simple and contains the fewest foods. Types II and III are the average breakfast served in most homes. Type IV is a very hearty breakfast made up of many food classes and usually served in two or three courses.

Types of breakfast suitable for different persons are:—

Type I.	Type II.	Type III.	Type IV.
Persons not active	Growing children and persons of sedentary habits	Undernourished children and persons active	Man at muscular work
Fruit Bread Beverage	Fruit Cereal Toast Milk or beverage	Fruit Cereal Protein (eggs) Bread Cocoa or beverage	Fruit Cereal Protein (meat or egg) Potatoes or fried cereal Bread Beverage

The following breakfast menus are suggested as being good combinations. Several kinds of hot dishes are suggested as suitable to each combination.

BREAKFAST AIDS IN MENU BUILDING

Fruit	Cereal	Hot Dish	Bread	Beverage
I. Oranges, apples, peaches, grapes.	Rolled oats.		Buttered toast, French toast, sirup.	Coffee. Milk or cocoa for children.
II. Berries, fresh, canned.	Corn flakes, puffed rice, grapenuts.	Poached egg, baked eggs, omelet.	Toast.	Coffee.
III. Baked apple, apple sauce.		Liver and bacon, fried potatoes.	Toast, jelly, toasted cinnamon rolls.	Coffee.
IV. Grapefruit, oranges.	Cream wheat, steamed rice.	Corn beef hash, fried potatoes chipped beef in cream.	Toast.	Coffee.
V. Canned or fresh fruit.	Rolled oats.	Fried cornmeal mush, fried cereal, griddle cakes, waffles.	Toast.	Coffee.
VI. Stewed dried fruit, apricots, prunes, peaches.		Ham, jelly omelet, bacon, sausage.	Toast.	Coffee.
VII.	Rolled oats with dates, raisins.	Bacon, chipped beef in cream.	Muffins, popovers.	Coffee.
VIII. Fresh fruit, berries.	Shredded wheat, corn flakes.	Eggs on toast, scrambled eggs, golden rod eggs.	Buttered toast.	Coffee.
IX. Cantaloupe.		Ham, eggs.	Toasted muffins, honey.	Coffee.
X. Canned fruit, apple sauce- oranges.		Creamed codfish, codfish balls, bacon, baked potato.	Corn bread, corn muffins.	Coffee.

QUESTIONS AND PROBLEMS

What type of breakfast do you eat? Is it suited to you?

Do you include all classes of food in your meals?

What food do you need more of?

What is the difference between your breakfast and your mother's?

Why should children have a different breakfast from a man working in an office?

Why do old persons need much the same food as children?

Could a breakfast menu be used for supper?

APPLICATION

Plan a breakfast menu.

Make food charts to be used at home.

Make list of dishes included in previous lessons suitable for breakfast. Assign girls to make posters illustrating good and poor breakfast combinations for school children.

Week's Food Chart for Breakfast

	ENERGY FOOD	TISSUE BUILDER	PROTECTIVE	REGULATING
SUNDAY (Example)	Toast and jam.	Milk.	Orange.	Oatmeal.
MONDAY				
TUESDAY				
WEDNESDAY				
THURSDAY				
FRIDAY				
SATURDAY				

Fill in the food under each class which you eat for breakfast on each day of next week. Note the example above.

From this chart you can tell what kinds of foods you have eaten.

Have you had enough of each kind which you require?

How could you suggest changing it for next week?

MEAL PLANNING

If girls are more interested in planning and serving supper than breakfast, the first menu work may be suppers. The type of meal is very much the same and the foods are similiar. The fruit of breakfast may be used as the dessert for supper, the hot bread and toast be the same, the beverage the same and the only change being in the hot dish used in place of cereals.

If supper menus are used first, the cream soup lesson should follow the milk lessons and the work on main luncheon dishes should be used before the menu lessons are started. A distinction can be made between the supper and the luncheon menu and work, which comes later, by making the supper follow the luncheon menus in types I and II.

HOME PROJECTS

Keep food chart and check foods used each day during the week.

Prepare breakfast at home two days in the week.

Prepare one supper menu similar to the breakfast menu, making the change in the hot dish.

LESSON 12

BREAKFAST

Table Service

The dining room should be a pleasant and convenient room located near the kitchen.

The decorations should be pleasing, harmonious, and quiet in tone, as well as simple, and the pictures suitable. The light must be good, yet not too strong, and the temperature about 70° F.

The furniture of the dining room includes a china closet, chairs, table, buffets or sideboards, and a serving table.

The buffet or *sideboard* contains the silver and linen, and should always be covered with a white linen cover.

The serving table is also covered, and is used for dishes for the desserts and coffee service.

The table may be round, oblong, or square, according to the shape of the room and the size of the family. It occupies the center of the room. The place for the hostess is opposite the pantry door, through which the waitress enters. She can then direct the movements of the waitress in case of emergency without attracting the attention of the guests.

The chairs are arranged around the table with the front edge of the seat just touching the cloth. Place only one chair at each end of the table, for host and hostess, opposite each other, and space the chairs evenly for the guests.

Linen.—There is a wide choice of linens which may be used for breakfast. Pretty runners, oblong place pieces or doilies may be used if the polish of the table is good. These are time-savers; for the laundrying is much more simple than for large tablecloths. There are many colored and attractive small cloths which one may use if the table is to be covered all over.

Flowers.—Some little bowl of fresh flowers or a growing

plant should always be used in the center of the table. Even a little green vine adds a pleasing touch. Avoid too high a basket or vase of flowers. Select flowers free from heavy odors, and those that harmonize with the coloring of the dining room.

Dishes for breakfast may be bright colorful ones of porcelain or china. There are many kinds of simple dishes which add to the attractiveness of the breakfast table.

Silver.—The necessary silver for the meal should be placed on the table before the family assembles. Have just enough for each one without forgetting the silver for

Detail of cover for breakfast, showing correct location of silver and dishes.

serving. The arrangement of silver is the same for all meals and for all occasions.

Setting the Table.—A "cover" marks the individual place and includes all the silver for one person. From 20 to 25 inches of length and 15 or 16 inches of depth are allowed for each cover. Plates, silver, and napkins are placed one inch from the edge of the table in the order of service, the silver for the first course being farthest from the plates. Place the knife on the right-hand side of the plate with the cutting edge of the knife turned towards the plate. The spoons are placed next to the knife on the right side in the

order in which they are to be used, the spoon for the first course being farthest from the plate. The forks are placed on the left side of the cover. The fork to be used first during the meal being farthest away from the plate and the dessert fork nearest the plate. The tines of the forks are always turned up. The number of pieces of silver depends upon the foods to be served.

The napkin is placed to the left of the forks, with the corners of the napkin towards the edge of the plate and the lower edge in a straight line with the row of silver and plate.

The bread and butter plates are placed at the left, at the top of the forks. Put the butter spreaders on the plates with the handle convenient to the right hand. Place the tumbler for water at the right-hand side, at the end of the knives, and the individual salts at the top of the cover in the center.

Styles of Serving.—There are two ways of serving meals:

A la Russe, or *Russian style*, where only flowers, silver, and china are placed on the table at the beginning of the meal. The several courses are served from the side, each person helping himself when the dishes are passed; or the plates are served in the kitchen and placed before each guest. This style is best adapted to serving large numbers.

The *English style* of serving is used at small dinner parties and in the home. The host carves and serves the meat and vegetables and the hostess serves the soup, salad, dessert, and coffee. Only one course appears on the table at a time. Bread, butter, pickles, and relishes are placed on the table and passed by the waitress. The waitress also passes the plates and dishes served by the host and hostess.

In many homes the service of the meal is a combination of both the Russian and the English service. That is, one course such as the soup or perhaps the salad or dessert is served from the kitchen and the meat course at the table

by the host. This is sometimes spoken of as the Compromise service.

Service without a Maid.—The average home can not afford a maid and many homemakers that can afford one prefer to do their own work. It is quite necessary that every girl should learn to do for herself and be able to assume the duties of cook, hostess, and maid, easily and gracefully, whenever she chooses to do so.

Entertaining without a maid is more informal and necessarily more simple than when a maid is employed, but the charm of any home meal lies in its being properly planned and served.

Successful entertaining in the home depends largely upon the hostess. She should be natural and appear at ease. When her work is well planned, so that she has no anxiety as to the outcome, she can be at ease. She should attempt only simple things at first until she gains confidence. Then practice will help her.

Rules for serving remain the same for all meals and at both the formal and informal occasions. Where there is no maid to attend to the wants of the guests at the table, much of the table service is performed at the table by the host and hostess very successfully and with added hospitality.

Rules for serving without a maid:—

1. Warm all dishes used for hot foods, and chill all dishes used for cold foods.
2. Fill water tumblers ¾ full, just before guests sit down. Keep the glasses filled.
3. Place butter on butter plates just before guests are seated, replenishing when necessary.
4. Use a small round tray covered with a doily or a folded napkin for serving and removing dishes.
5. Cut the bread just before serving, so that it will not dry out. Hot breads should be covered with a clean folded napkin or linen square to keep them hot.

6. Be sure that all the silver is in place at each cover and at the hosts' and hostess' places for serving.

7. Have all dishes for each course ready for serving.

8. Boys as well as girls should be taught to wait on the table correctly and take their turn serving so that mother is relieved of that duty. Mother is the hostess and her place is at the table.

9. The hostess assigns each guest to his or her chair at table. Guests should take their places quietly.

10. Keep all hot dishes hot by keeping them in the oven with heat reduced.

11. Leave nothing cooking which requires the attention of the hostess to make her uneasy.

12. Creamer and sugar with cups and saucers should be arranged on a large tray on the side table ready for the coffee pot. The tray should be set before the hostess at the time to serve the coffee.

13. Some other member of the family may have such duties as filling water glasses and serving vegetables or cereals at the table.

14. Remove soiled dishes from the hostess' cover first. Then each cover to the right in turn.

15. If the hostess waits on the table, she removes the soiled dishes from the cover at her right first, then each in turn around the table.

16. In removing dishes stand at the left side of a guest, pass the left hand over the shoulder and remove the dish from the table, using the left hand. Transfer the dish to the right hand to carry it to the kitchen.

17. In placing dishes to be served, carry dishes to the table in the right hand, then, standing at the left side of guest, transfer the dish from the right to the left hand, and place it over the left shoulder in front of the guest.

18. Remove dishes containing food, one at a time first, in each course, then the soiled plates and silver of each

cover in turn and carry them out of the dining room.

19. Remove everything pertaining to one course before serving the next.

20. Use a folded napkin and small tray to crumb the table, if crumbing is desired.

21. Fill finger bowls ⅓ full of warm water. Finger bowls are necessary if fresh fruit is used. Only individual finger bowls should be used.

22. Never reach in front of a guest.

23. Never stack dishes in front of a guest.

24. The member of the family who waits on table should rise quietly to perform her duties, leaving her napkin partially folded at the left side of her plate while she is serving.

25. Left-hand service for all dishes except the beverage is now regarded as best.

Serving a Breakfast.—To serve a breakfast correctly in the home should be an easy problem, yet breakfast is the one meal which is most often slighted and hurried.

It is a very good practice to have all members appear for breakfast and be served together. Mother can feel that each one has had the proper start for the day and the family spirit at breakfast can, if each one tries, be a very happy one. Good mental atmosphere is one of the first aids to digestion.

To simplify the service and make it as efficient as possible should be the aim.

Breakfast in most homes consists of two courses or the fruit and cereal courses may be combined in one to make the service simple and easy. When a hot dish is used it is served with the bread and beverage as a second course.

Serving Breakfast without a Maid.—Before breakfast is announced the fruit and cereal courses should be on the table. Fruit may be in one large dish or basket, ready to be passed, or on small plates on the service plate at each cover. The tureen with cereal with individual dishes for serving should be at the hostess' place. Where fruit is handled with the

fingers, a finger bowl is necessary. Individual ones may be set at the top of each cover before breakfast is announced, if fruit is on the plates, or on the plates and removed by each guest to the top of cover when fruit is passed and ready for the plate.

When the fruit course is finished, the cereal dish may be set on the service plate and the small fruit plate set above the cover to simplify the service. If preferred, the fruit plates may be passed to the hostess, who puts them on the serving cart or side table by her.

When the cereal is finished, dishes from both courses are removed to the kitchen. Bring in dishes of food to be served first and place at the top and side of the host's place. Then plates, in a pile, should be set in front of the host. The coffee service on the tray is moved to the hostess' place, the bread is brought in, and glasses refilled.

The host serves the plates, which are passed down the side of the table—never across. The hostess receives hers first, the guests next in turn.

Coffee cups are passed in the same manner. The hostess may use the cream and sugar for each one, if she knows their particular wants.

Toast or hot bread should be served hot. It should be kept in a warm place in the kitchen during the first course. If toast is made at the table, the slices of bread should be piled on a plate neatly and set at the left of the person whose duty it is to toast them. The toaster is placed in front of that cover at the top.

Butter is best served on individual plates set at the upper left-hand corner above the forks. Cut the butter in small uniform-size pieces and serve in squares, balls, or fancy prints. Butter must not be served long before the meal is ready or it will become too soft. Serve it just before pouring the water the last thing before the family assembles for the meal.

QUESTIONS AND PROBLEMS

1. Why should children eat breakfast?
2. What fruits are in season now for breakfast?
3. What cereals are the best this time of the year?
4. What beverages are good for children's breakfast?
5. Why does father not need the same beverage?

APPLICATION

1. Set a Cover for a breakfast for type of breakfast used at home. Set the table for the breakfast to be served at school.

2. Prepare and serve a simple breakfast of type 2, during the laboratory period.

3. Have plans complete, so that preparation and serving of the meal may be easily done during the lesson time.

NOTE.—Breakfast plans and serving should continue through the quick bread lessons. Girls work in groups, each group serving a breakfast each lesson. The lessons on quick breads should be applied directly to the breakfast served that day. Plans of groups for their breakfast should be submitted and discussed the week previous to serving breakfast.

HOME PROJECTS

1. Plan home breakfasts for a week to include foods for the children and grown-ups according to their special needs.

2. Set table for breakfast every day for a week. If time in the morning does not permit, set the table at night ready for morning.

3. Prepare the fruit for breakfast for at least two mornings.

LESSON 13

QUICK BREADS AND POUR BATTERS

Bread is used by all nations and all classes of people to furnish a large portion of their foodstuffs. Just as some particular vegetable is used by the people of one nation or by the people of one part of a country more than another, so the type of bread used by different people varies.

To people living in the northern part of our country bread for a meal generally means a raised yeast bread baked in loaves or rolls. To people living in the southern part of our country bread for a meal invariably means a hot bread such as biscuit or corn bread. And so in each country there is usually one particular bread used more than any other.

Bread in general may be grouped in two classes:—1. Quick breads. 2. Yeast breads, treated in Lesson 18.

Bread mixtures are either *batters* or *doughs*, depending upon the proportion of flour and liquid used.

Batters are mixtures that are beaten.

Doughs are mixtures too thick to be beaten and so are kneaded.

Proportion of liquid and flour for batters and doughs:—

BATTERS

Pour.....1 c. liquid to 1 c. flour

Drop.....1 c. liquid to 2 c. flour

DOUGHS

Soft.....1 c. liquid to 3 c. flour

Stiff.....1 c. liquid to 4 c. flour

Quick-bread mixtures are either batters or soft doughs.

Yeast-bread mixtures are stiff doughs.

Quick breads are so named since they require a shorter time for preparation than the yeast breads. They are usually served hot. Quick breads used for breakfast may include any or all kinds.

Food Value.—Quick breads are harder to digest than raised breads. The use of hot breads is not recommended for persons who have difficulty with digestion, and children under six years of age should not be allowed to eat them.

Materials for Quick Breads.—*The Liquids* used are water and milk. Some other materials such as molasses, fat, and sugar have the effect of liquid when baked in a mixture.

The fats used are butter and butter substitutes such as lard, oleomargarin, the commercial preparations of fat and clarified fat drippings. Fats serve to make the bread tender.

Eggs. The albumen of the egg in the uncooked mixture appears to add to the liquid, but when baked the albumen thickens. Eggs, therefore, are not counted as liquid but as a thickening agent.

Flour used is wheat flour or meal (corn, rye or Graham). Different flours take up more moisture than others so that the exact amount can not be definitely given. Corn meal takes up about twice as much moisture as wheat flour.

Salt adds to the flavor or taste. The amount of salt depends upon the fat used. If the fat used contains little salt, then more salt should be added.

Proportion of fat with flour for batters is:—

½ to 1 tbsp. of fat to 1 c. of flour.

Proportion of salt with flour:—

½ tsp. of salt to 1 c. of flour.

EXPERIMENTS

The Effect of Steam and Air in Flour Mixtures

1. Fill a cup with flour. Sift it once and put it back into the cup. Does it all go in? How much difference is there?

2. Make a pour batter by mixing ⅛ c. of flour and ⅛ c. water. Beat hard and put into a greased muffin pan. Bake 15 minutes in a moderate oven.

3. Make a thick batter by mixing ¼ c. of flour with ⅛ c. water. Beat hard and make as in Experiment 2. Compare the two baked products. What is the difference?

4. Make a pour batter as in Experiment 2. Add ½ egg white.

Beat hard and bake as before. Compare with Experiment 2 and Experiment 3. What makes the difference in the appearance and texture of the product?

Leavening Agents.—Flour mixtures when baked would be very hard and indigestible if no leavening agent were used. Air, steam, and carbon dioxide gas are the agents used for this purpose.

Air is introduced into flour mixtures (1) by adding eggs and then beating the mixture, or (2) by beating the eggs first and adding to the mixture.

Steam.—The liquid in a heated mixture is converted into steam and is expanded many times. This puffs up the mixture. The heat of the oven hardens the mixture and holds the steam in. Mixtures without flour fall when cool, as steam changes back to water when cold.

Heat expands the air during baking. Too hot an oven bakes the mixture before the expansion of the air takes place.

Batters raised by air must be beaten very hard and put quickly into a hot oven. Pop-overs are an example of mixtures raised by air and steam.

Carbon Dioxide.—Yeast separates sugar into carbon dioxide and alcohol. As the carbon dioxide gas is evolved its increasing pressure distends, or leavens, the dough.

Directions for mixing quick breads:—

1. Sift and mix the dry materials.
2. Add the wet materials to the dry.
3. Beat eggs separately and add to the mixture, and beat thoroughly.
4. Rub or cut shortening in cold; or melt and add to the mixture.
5. Use a large mixing spoon.
6. Mix quickly and put into the oven to bake quickly.

Pans.—Oil pans thoroughly. Use a small brush or a piece of paper for oiling.

Baking.—Quick breads should be baked as soon as mixed,

in order to hold all the leavening material (air, steam, and gas) in the mixture. It is especially necessary to do so with thin batters, also those raised by air or those raised by soda and liquid acids (sour milk and molasses).

It matters little what fuel is used, but in all cases the heat of the oven must be right and ready when the mixture is ready to be baked. Plan according to the fuel used. If the oven is too hot when the mixture is ready, set a pan of cold water in the oven to absorb some of the heat.

Fuel bills can be reduced to a minimum with a little forethought and planning. Having a fire going too long before the heat is needed or keeping the fire going up to the time the breads are baked in unnecessary. The oven usually holds heat sufficient for the last five minutes of baking.

As much of the success of quick breads lies in the baking as in the mixing. Many stoves now come equipped with oven thermometers to help in testing correct temperatures for baking. Some of these are reliable, but many of them get out of order and can not be depended upon. One type of oven regulator now available, however, not only gives the temperature of the oven but also controls the heat. A patent device may be set at any temperature desired and that temperature will be maintained throughout. According to a chart provided with the stove a correct temperature for each food is given Where the same heat is to be maintained during the baking process this is an invaluable aid.

Unfortunately the greater majority of homes are not equipped with these aids and some simple oven tests must be available for those which are not.

Temperature of Oven.—Different mixtures require different temperatures, and most recipes designate the temperature of the oven. In order to ascertain the temperature, some simple tests similar to the following are used:—

1. A moderate oven turns a piece of white paper golden brown in 5 minutes.

2. A hot oven turns a piece of white paper dark brown in 5 minutes.

A quicker test is as follows:—

Put ½ tsp. of flour on a piece of unglazed paper.

A *hot oven* turns the flour light brown in 10 seconds.

A *moderate* oven turns the flour light brown in 30 seconds.

A *slow* oven turns the flour light brown in 60 seconds.

If an oven thermometer is used, the following table is helpful.

CLASSIFICATION OF OVEN TEMPERATURES

Slow	Moderate	Hot	Very hot
250°-350° F.	350°-400° F.	400°-450° F.	450°-550° F.
Custards	Muffins	Pop-overs	Pastry
Eggs	Molasses Mixtures	B. biscuits	
		Rolls	
Soufflés	Bread-loaf		
Cheese dishes	Gingerbread		
	Plain cake		
Meringues	Cookies	Cream Puffs	
	Loaf cakes		
Angel food			
Sponge cake			

Note: Cakes without fat need a temperature between slow and moderate.

TIME GUIDE FOR BAKING QUICK BREADS (with gas).—

Pop-overs.....30 min.
Biscuits (baking powder).....10 to 20 min.
Corn bread (thin).....15 to 20 min.
Corn bread (thick).....30 to 40 min.
Muffins (baking powder).....20 to 25 min.
Gingerbread.....30 to 45 min.

The time for baking is divided into quarters, as follows:—

1. Mixture rises.
2. Mixture continues to rise, and browns slightly.
3. Mixture finishes rising, and browns all over.
4. Mixture finishes baking, and shrinks from the pan.

QUESTIONS AND PROBLEMS

1. Of what kind of mixtures are pancakes made?
2. Of what kind of mixtures are muffins made?
3. In what class of mixtures do pop-overs belong?
4. Where have you used steam for making a mixture light?
5. Why do eggs hold air in a mixture?
6. Name an example of soft dough.
7. What is the correct way to measure flour?
8. What leavening agents are used in pop-overs?

APPLICATION

1. Pop-overs (thin batter)

1 c. flour	¼ tsp. salt
1 c. milk	2 eggs

Method.—Put the flour in a bowl, make a well in the center, and drop in the salt. Add the milk gradually, and stir well. When smooth add the unbeaten eggs and beat hard until light. Bake in hissing hot muffin pans in a hot oven 45 minutes. Serve hot. Makes 8 pop-overs.

(*Basis for* 2 *girls,* ½ *rule.*)

2. Griddle Cakes (sweet milk)

2½ c. flour	2 c. milk
4 tsp. baking powder	1 egg
¼ tsp. sugar	2 tbsp. melted fat
1 tsp. salt	

Method.—Mix and sift the dry ingredients; beat egg, add milk, and then add the wet mixture to the dry. Beat thoroughly and add the butter. Cook the same as Sour Milk Griddle Cakes. Begin cooking cakes at once or more baking powder will be required.

(*Basis for* 2 *girls,* ¼ *rule.*)

3. Sour Milk Griddle Cakes

2 c. flour	1 egg
1 tsp. soda	½ tsp. salt
2 c. sour milk	

Method.—Mix and sift the dry ingredients; add the sour milk and egg well beaten. Bake by spoonfuls on a hot, greased griddle. (Beat the batter well before pouring a fresh batch of cakes on the griddle.) When puffed up and cooked on the edges, turn and cook on the other side. Grease pan, and repeat. If large bubbles form at once on the top of the cakes, the griddle is too hot. If the top of the cake stiffens before the under side is cooked, the griddle is not hot enough.

(*Basis for* 2 *girls,* ¼ *rule.*)

4. Bread Griddle Cakes

1¼ c. fine stale bread crumbs
1½ c. scalded milk
2 eggs
2 tbsp. butter
4 tsp. baking powder
½ c. flour
½ tsp. salt

Method.—Add the milk and butter to the crumbs, and soak until crumbs are soft; add eggs well beaten, then the flour, salt, and baking powder mixed and sifted. Cook the same as other griddle cakes.

(*Basis for 2 girls, ¼ rule.*)

5. Waffles

1 c. milk
2 eggs
Pinch of salt
¼ c. melted butter
2 sc. tsp. baking powder
Flour to make soft batter (about 1½ c.)

Method.—Beat flour and milk, add butter, and beat. Add the well-beaten yolks and beat again; then add baking powder and a little salt and beat very hard for a few minutes. Fold in the well-beaten whites lightly. Have iron very hot; bake, and serve at once.

Brown Sugar Sirup for Waffles and Cakes

1 c. brown sugar
¼ c. water
1 tbsp. butter
½ tsp. vanilla

Method.—Boil the sugar and water 5 minutes, then add the butter and vanilla and serve hot or cold.

6. Cream Puffs

1 c. boiling water
½ c. butter
1 c. flour
4 eggs

Method.—Put the fat and the water in a saucepan over the fire. As soon as it begins to boil add the flour all at once, stir it quickly and well until the mixture leaves the sides of the pan. Remove from the fire, cool, add one unbeaten egg and beat hard. Add another egg and beat again. Continue until all the eggs are added. Drop by spoonfuls on a well-oiled pan about three inches apart. Bake in a moderate oven 25-40 minutes or until firm to the touch. Cool, split with a sharp knife, and add filling of whipped cream or soft custard. Creamed vegetables or meat may be served in these shells, as in patty shells.

Whipped Cream Filling

1 pt. heavy cream
¼ c. sugar
1 tsp. vanilla

Beat cream until thick, add the sugar and the flavoring.

7. Chocolate Eclaire

Use cream puff mixture. Shape in pieces 4½ inches long and one inch wide on the baking sheet and bake as cream puffs. Split and fill with whipped cream and frost the top with a chocolate frosting.

MEAL PLANNING

The simple breakfast or supper work as the case may be should continue, a different group serving the meal each week. The quick breads may be used as the hot bread for the meal. If two breakfasts are served by two groups, then a different bread could be used. Pop-overs should be used to illustrate the raising of a batter by air and steam. A different beverage may be used.

SUGGESTED BREAKFAST

Oranges

Rolled oats Pop-overs

Coffee

How could this breakfast be adapted to the children for their meal?

SUGGESTED SUPPER

Scrambled eggs with tomato sauce

Waffles Sirup

Tea or cocoa

HOME PROJECTS

1. Prepare cereals for breakfast for a week.
2. Get breakfast Sunday morning for the family.
3. Prepare pop-overs for one evening meal.
4. Prepare pancakes for one breakfast.

LESSON 14

QUICK BREAD—DROP BATTERS—MUFFINS

Baking Powder

A batter may be made light by any of the leavening agents but only thin or pour batters can be successfully raised by air and steam. When the mixture contains more flour than moisture a more powerful lifting agent is needed to lighten it. Carbon dioxide gas is introduced in mixtures for this purpose.

To test for acid and alkaline substances:—

Acid:—Put the end of a piece of blue litmus paper in ⅛ c. thick sour milk. Also test ⅛ c. molasses in the same way. Blue litmus turns pink when acid is present.

Alkaline:—Put 1 tsp. soda in ⅛ c. water. Put the end of a piece of pink litmus paper in the soda water. Pink litmus paper turns blue when an alkaline substance is present.

EXPERIMENTS

The Action of Soda on Acid Substances

1. Put ⅛ tsp. soda in 1 tbsp. thick sour milk.
2. Put ⅛ tsp. soda in 1 tbsp. molasses. Watch carefully for any action taking place. Test both mixtures with blue litmus for acid.
3. Mix ¼ tsp. soda with ½ tsp. cream of tartar. Add ⅛ c. cold water to the mixture. Is there any action? Heat the mixture. Does heat make any difference?
4. Put ¼ tsp. baking powder in ½ c. cold water.
5. Put ¼ tsp. baking powder in ¼ c. boiling water. Compare Experiments 4 and 5.

When the color of pink or blue litmus paper is not changed by a solution, neither acid nor alkaline substances are present. The solution is then said to be neutral. A substance that changes an acid solution to a neutral one neutralizes the acid. Alkaline substances neutralize acids.

Soda (as shown by experiments) neutralizes acids. During this chemical change bubbles of gas were given off. This gas is called carbon dioxide gas and is used in making flour mixtures light.

Carbon dioxide gas is produced in flour mixtures:—

1. By using soda with some acid material (sour milk, molasses, cream of tartar).
2. By the addition of baking powder (a soda and acid mixture).
3. By the action of yeast.

Baking powder is a mixture of:—

1. Soda (an alkaline substance).
2. Some acid substance.
3. A little starch.

The soda and the acid substance used in making baking powder must be dry and also dissolve readily in water.

The acid substances used in baking powder are any one of the following:—

1. *Cream of tartar* (potassium acid tartrate).
2. *Calcium acid phosphate.*
3. *Tartaric acid.*
4. *Alum* (sodium aluminium sulphate).

Any of these acid substances act upon soda and set free the carbon dioxide gas.

The difference in commercial baking powders is in the kind of acid used. Some contain one, some another, and still others a combination of two of these acid substances. The composition of baking powder is always given on the label of each can. Some acids react very slowly with soda, while others react more rapidly. A mixture of two acids, therefore, is frequently used to produce a more stable and efficient powder. Cream of tartar and tartaric acid are combined in some powders. Calcium acid phosphate and alum are combined in other powders. The amount of residue, that is, the particles left in a baked mixture after the chemical action takes place, is very small and it has been proven to be harmless.

Some powders have better keeping qualities than others. All powders should be kept dry and in tightly closed jars

away from air and moisture to preserve their quality.

The starch is used in baking powders to absorb any moisture in the air and to prevent any reaction of ingredients until the gas is to be used in baked mixtures.

Dried egg white called "egg albumen" is sometimes used in very small amounts in the manufacture of baking powder. Egg albumen dissolves readily and aids in holding the liberated gas in the mixture. It is beneficial when oven

Muffins should be well raised and nicely browned.

temperatures are not properly controlled or when mixtures stand for some time before baking.

Proportions of baking powder for flour mixtures:—

Use 2 teaspoonfuls of baking powder with each cupful of flour (if no eggs are used).

Use 2½ teaspoonfuls of baking powder with each cupful of whole wheat flour and meal (if no eggs are used).

In substituting baking powder for eggs in a recipe add ½ teaspoonful of baking powder for each egg omitted.

Baking powder is used in mixtures having sweet milk or water as the liquid.

QUESTIONS AND PROBLEMS

1. Why do drop batters need some other leavening agent besides air and steam?
2. How can you test a liquid for acid?
3. How can you tell whether a liquid is neutral?
4. Would sour milk a day old contain the same amount of acid as some that is three days old?
5. Why should you always put the top on the baking powder can as soon as you finish measuring the baking powder you need?
6. Why should quick breads be put in the oven as soon as they are mixed?

APPLICATION

1. Muffins (Standard Rule)

2 c. flour	½ tsp. salt
3 tsp. baking powder	1 egg
2 tbsp. sugar	2 tbsp. melted fat

1 c. milk

Method.—Mix and sift the dry ingredients, separate the egg, beat the yolk slightly and the white to a stiff froth. Add the milk, beaten yolk, and melted butter to the dry ingredients. Fold in the stiffly-beaten whites. Bake in buttered muffin pans 25 minutes.

(*Basis for* 2 *girls,* ¼ *rule.*)

VARIATIONS OF MUFFINS RULE

Blueberry Muffins

Add ⅓ c. sugar
½ c. blueberries

Method.—Mix the same as the plain muffins. For blueberry muffins use a little less milk, since the juice of the berries add moisture.

(*Basis for* 2 *girls,* ¼ *rule.*)

Richer Muffins

Use double the amount of fat and sugar as in standard rule.

(*Basis for* 2 *girls,* ¼ *rule.*)

Date Muffins

Use double the amount of fat and sugar and add

¼ lb. dates cut fine
1 additional tsp. baking powder

(*Basis for* 2 *girls,* ¼ *rule.*)

Rice Muffin

Add ½ c. hot cooked rice
1 tsp. baking powder

Method.—Mix and sift the dry ingredients; add ½ the milk and the well-beaten egg. Mix the remainder of the milk with the rice and add to the first mixture, beating thoroughly. Then add the melted butter and bake in buttered muffin tins.

(*Basis for 2 girls, ¼ rule.*)

2. Invalid Muffins

1 c. flour	½ c. milk
1 tsp. baking powder	2 eggs (whites)
½ tsp. salt	2 tbsp. melted butter

Method.—Mix and sift the dry ingredients, add the milk gradually, the eggs well beaten, and lastly the melted butter. Bake in a moderate oven in buttered gem pans. After baking, let stand in the oven, with door open, until the crust is dry and crisp. Serve hot or cold.

3. Nut Bread

4 c. flour	1 c. chopped nuts
1 tsp. salt	2 c. milk
4 hp. tsp. baking powder	½ c. sugar
1 egg	

Method.—Sift dry ingredients and add nuts. Beat the egg, add the milk, and stir wet mixture into dry. Put in well-oiled bread tins. Let stand about 20 minutes to rise. Bake ½ hour in a moderate oven. This recipe makes 2 loaves.

MEAL PLANNING

Prepare and serve a breakfast, using plain muffins for the bread. If supper plans are used instead of breakfast, use some variation to the muffin rule. Plain muffins are better for breakfast.

HOME PROJECTS

1. Make muffins according to the Standard Rule for 1 meal.
2. Make muffins, using 1 variation of this rule.
3. Determine the different methods of combining the different ingredients, and time of preparation. Compare the texture of the different products.

LESSON 15

QUICK BREADS MADE IN LOAF

Soda with Liquid Acids

When sour milk or molasses is used in flour mixtures, soda is used to neutralize the acid and act as a leavening agent. The difference in the quantity of acid present in sour milk as well as the varying amounts present in different kinds of molasses makes it impossible to judge the exact amount of soda to use. For this reason prepared baking powders with sweet milk are more accurate and easier to use as leavening than soda with liquid acids.

The general proportion of soda with acid material is:—

½ tsp. soda with 1 c. thick sour milk.

½ tsp. soda with 1 c. molasses.

For homemade baking powder in emergency use:—

½ tsp. soda with 1¼ tsp. cream of tartar to equal 2 tsp. baking powder.

If more soda is used than is needed to neutralize the acid, the baked product becomes discolored, has yellow spots throughout, and tastes bitter. Much care is necessary in measuring soda. All lumps must be mashed out before measuring in order to be accurate.

Substitution of Sour Milk for Sweet.—When one desires to substitute sour milk for sweet milk in a rule, an equal amount of milk is used, but sour milk requires soda. Soda gives four times as much gas as baking powder. 1 teaspoonful of soda, therefore, is equal to 4 teaspoonfuls of baking powder, or ½ a teaspoonful of soda is equal to 2 teaspoonfuls of baking powder.

If the rule (using standard muffin rule for example) calls for 4 teaspoonfuls of baking powder—1 cupful of milk—2 cupfuls of flour, and we substitute 1 cupful of sour milk for 1 cupful of sweet milk, then we need to use ½ a teaspoon-

ful of soda with the 1 cupful of sour milk. But ½ a teaspoonful of soda equals only 2 teaspoonfuls of baking powder and the rule calls for 4 teaspoonfuls of baking powder. We need to use 2 teaspoonfuls of baking powder in addition to the ½ teaspoonful of soda in order to produce the right quantity of carbon dioxide gas.

Quick breads containing molasses require a more moderate oven for baking than those without molasses.

Quick Breads Made in Loaves.—Some quick bread mixtures are baked in loaves or steamed in cans and they require a longer time for preparation. These can not be rightfully called quick breads; but, since they have the same kind of leavening agents as other quick breads and are beaten instead of kneaded, they belong with that type of mixture.

Nut bread is an example of a baking powder mixture baked in a loaf. This mixture is allowed to stand twenty minutes in the pan before baking in order to produce the necessary gas to lift the heavy mixture.

Steamed brown bread is an example of a soda and sour milk mixture steamed in a can. The steaming requires two to three hours, depending mainly upon the size of the cans.

Steaming is a method of applying heat to food to cook it. Food may be cooked either by moist steam or dry steam. Cereals, when cooked in a double boiler, are cooked in dry steam. Steamed breads are cooked in moist steam. This is applied by placing the cans containing the bread mixture in a steamer over a kettle of boiling water or the can may be set on a rack in the kettle and enough water added to come up around the cans half way. The rack is used to raise the cans up from the bottom and prevent burning.

General directions for steaming mixtures:—

1. Use a tin mold or can with a tight-fitting cover.
2. Oil inside of mold and cover thoroughly.
3. Fill cans only ⅔ full.
4. Tie covers on securely.

5. Set mold on a rack in a kettle containing enough boiling water to come half way up on the mold or set mold in a steamer over boiling water.

6. Cover the kettle or steamer tightly.

7. Keep water boiling and add more as needed.

8. Set the mold in the oven for a few minutes to dry off after steaming is done.

Time for Steaming Mixtures.—The time for steaming depends on the nature of the mixture to be steamed and the kind of a mold used.

Mixtures which contain much fruit and suet require longer time for steaming than plain mixtures. Tin conducts the heat more readily than granite or porcelain and mixtures require less time for steaming in tin molds than in heavy molds.

STEAMED MIXTURES

Molds	*Mixtures*	*Time for Steaming*
Individual, tin	Plain	½-1 hour
Pound, tin	Plain	2-3 hours
Pound, tin	Fruit	3-4 hours
Larger than 1 pound	Plain	3-4 hours
Larger than 1 pound	Fruit	4-5 hours

QUESTIONS AND PROBLEMS

1. Could buttermilk be used in place of sour milk?
2. What causes yellow spots in soda biscuits?
3. What could you use for leavening agent for muffins if you had no baking powder?
4. In adding raisins to a quick bread what needs to be done first?
5. What are the best fats to use in quick breads?
6. What proportion of salt is used with 1 c. flour for most quick breads?
7. What proportion of fat is used with 1 c. flour?
8. What kind of oven temperature do mixtures containing molasses require?
9. How many methods of cooking food can you name?
10. How many methods of cooking have we had during the lessons?
11. Why is it necessary to set a mold on a rack in steaming a mixture?

APPLICATION

1. Hot Water Gingerbread

1 c. molasses
½ c. boiling water
2¼ c. flour
1½ tsp. ginger
1 tsp. soda
½ tsp. salt
4 tbsp. melted fat

Method.—Add the boiling water to the molasses. Mix and sift the dry ingredients and add the wet mixture to the dry; then add the melted fat; beat hard. Pour in oiled pan or muffin tins, and bake in a moderate oven for 25 minutes.

¼ cupful of floured raisins may be added to make a variety.

(*Basis for* 2 *girls,* ¼ *rule.*)

2. Soft Molasses Gingerbread

¾ c. molasses
1 c. sour milk
¼ c. melted fat
¼ tsp. vanilla
1 tsp. soda
2 c. flour
½ tsp. salt
2 tsp. ginger

Method.—Sift dry ingredients. Add the sour milk to the molasses. Combine dry mixture with the wet. Add melted fat and beat vigorously. Bake in large pan or muffin tins.

(*Basis for* 2 *girls,* ¼ *rule.*)

3. Steamed Boston Brown Bread

1 c. rye flour
1 c. corn meal
1 c. whole wheat
¾ tbsp. soda
1 tsp. salt
¾ c. molasses
2 c. sour milk or 1¾ c. water

Method.—Mix and sift dry ingredients; add molasses and liquid; stir until well mixed; turn into a well-oiled mold and steam 3½ hours. Butter the cover before placing it on the mold. Fill mold ⅔ full. Baking-powder tins may be used for molds. Steam according to directions.

(*Basis for* 2 *girls,* ¼ *rule.*)

4. Brown Nut Bread

2 c. graham flour
1 c. white flour
2 c sour milk
2 tsp. soda
½ c. molasses
¼ c. sugar
½ c. raisins
½ c. nuts
1 tsp. salt

Method.—Mix the dry materials together; cut and flour the raisins and the nuts or add them to the dry materials. Add the sour milk to the molasses, and then add the wet materials to the dry. Oil one-pound

baking-powder cans thoroughly and pour in the mixture, cover, and let stand an hour; then bake 45 minutes in a hot oven. This recipe makes 3 loaves. Fill cans only ⅔ full, for the mixture rises before baking.

(*Basis for* 2 *girls*, ¼ *rule.*)

MEAL PLANNING

Prepare and serve a breakfast.

HOME PROJECTS

1. Prepare one quick bread, using sour milk and soda.
2. Make hot-water gingerbread once during the week.
3. Write a recipe for date muffins, substituting sour milk for sweet milk.
4. Prepare a Sunday morning breakfast for the family.

LESSON 16

QUICK BREADS—COARSE FLOURS

Quick breads made of the coarse flours make healthful breads rich in mineral salts and should be used much more frequently than most persons use them.

Coarse flour and meal weigh more for an equal measure than wheat flour. Consequently more leavening material is required to make baked mixtures light when they are used.

Proportions of leavening with 1 cupful of coarse flour:—

2½ tsp. baking powder with 1 c. coarse flour or meal or flour.

In substituting any of the coarse flours or wheat substitutes for wheat flour in a recipe the relative weights must be considered instead of an equal measure.

In substituting for 1 c. flour use the following measurements* which equal in weight 1 c. flour:—

⅔ tsp. soda and 1½ tsp. cream of tartar with 1 c. coarse flour.

Barley 1⅜ c.	Rye flour 1 c.
Buckwheat flour ⅞ c.	Graham flour 1 c.
Corn meal (coarse) ⅞ c.	Rice flour ⅞ c.
Corn meal (fine) 1 c. less 1	Potato flour ⅜ c.
Whole wheat flour 1 c.	Rolled oats (ground) 1⅛ c.

WHEAT

Wheat flour contains gluten, the protein substance in wheat. When moistened, it becomes elastic and sticky and serves to hold the air and gas in a mixture in much the same way as the albumen of eggs. For this reason wheat flour makes a lighter loaf of bread than flour made from other grains. Scalding some of the coarse flours or meals and scalding rolled oats before adding them to the other ingredients helps to hold the materials together better.

*From U. S. Dept. of Ag. (States relation service).

A combination of flour, using some wheat flour with a coarse flour, gives a better result than using all coarse flour or a combination of two coarse flours without using wheat.

Some flours, having different composition, combined together give much better results than others. Barley flour, buckwheat, or rolled oats are best combined with corn meal, rice flour, or potato flour.

The coarse flours made from wheat include Graham, whole wheat, and bran.

Graham flour is made by grinding the entire grain of spring wheat, including the outer bran coverings.

Whole-wheat flour is made by grinding the whole grains of spring wheat, with the exception of the two outer and coarser bran coats.

Bran is made by grinding the outercoats of wheat.

CORN

Source.—Corn is a native of America. It is raised over a wide area, but principally in Iowa, Illinois, Nebraska, Indiana, Missouri, and Ohio. These six states produce more than 40% of the total crop. The first two states produce more than 25%.

Composition.—Corn is similar in structure and composition to wheat, with the exception of the protein. Corn contains more fat than wheat and the protein has not the tenacious, elastic properties that gluten of wheat has. It can not be baked into a light, porous loaf. Corn meal is very heavy when used alone, and most recipes call for the addition of white flour, as the gluten in the flour helps to hold the air in the mixture. Corn contains a small quantity of cellulose compared with other grains.

The whole kernel contains 11.33% protein, 82.26% carbohydrates, 4.86% fat, and 1.54% ash.

Food Value of Corn.—Corn, being rich in fat and starch, furnishes much heat and energy to the body. It is deficient

in protein and salts, which lack necessitates its being used with foods containing tissue-building materials.

Uses.—The average yearly production of corn in the United States is nearly three billion bushels, more than any other grain crop. Much of this crop is used for stock feed; but corn holds an important place as human food. As such it is used as corn meal, hominy, starch, sirup, oil, in breakfast foods, and green and canned.

Corn meal is made in two grades. A rather coarse meal is made by grinding the whole kernel and removing only the coarsest bran. This meal is darker in color than the fine grade and does not keep well in summer, on account of the large quantity of fat in the germ. A fancy grade is made by removing both the skin and the germ from the kernel and grinding the remainder quite fine.

Composition of Common Flour and Meal

Kind	Water	Proteins	Fat	Carbohydrates	Fiber	Ash	Fuel value
Barley	11.9	10.5	2.2	72.8	6.5	2.6	1640
Buckwheat	13.6	6.4	1.2	77.9	0.4	0.9	1620
Corn meal	12.5	9.2	1.9	75.4	1.0	1.0	1655
Oatmeal	7.3	16.1	7.2	67.5	0.9	1.9	1860
Rice, whole	12.3	8.0	0.3	79.0	0.2	0.4	1630
Rye	12.9	6.8	0.9	78.7	0.4	0.7	1630
Wheat, fine	13.8	7.9	1.4	76.4	.....	0.5	1625
Wheat, entire	11.4	13.8	1.9	71.9	0.9	1.0	1675
Wheat, graham	11.3	13.3	2.2	71.4	1.9	1.8	1670

Quick breads containing coarse flours and wheat substitutes in place of all wheat require more moderate temperature and a little longer time for baking than those with all wheat flour.

When coarse flours are used without wheat flour, eggs are used to help hold the gas in the mixture. The albumen in

the eggs serves much the same purpose as the gluten in the wheat flour.

Warm mashed potatoes are sometimes used in quick breads for the same purpose of binding the materials together and they make the bread more moist and of finer texture.

QUESTIONS AND PROBLEMS

1. Why is corn bread heavier than wheat bread?
2. What foodstuff is more plentiful in corn than in wheat?
3. How does corn compare in food value with wheat?
4. How does whole wheat differ from Graham flour?
5. What is bran?
6. What is the difference in baking quick breads containing coarse flour from those made of all-wheat flour?

APPLICATION

1. Corn Meal Muffins

½ c. corn meal	1 tbsp. melted butter
1 c. flour	½ tsp. salt
3 tsp. baking powder	¾ c. milk
1 tbsp. sugar	1 egg

Method.—Mix and sift dry ingredients, add the milk gradually, then the egg well beaten, and the melted butter. Bake in a hot oven in oiled gem pans for 25 minutes.

(*Basis for 2 girls, ½ rule.*)

2. Graham Muffins

1 c. Graham flour	1 c. milk
¼ c. flour	1 egg
¼ c. sugar	1 tbsp. melted butter
1 tsp. salt	4 tsp. baking powder

Method.—Same as for Corn Meal Muffins.

3. Oatmeal Muffins

1½ c. milk	2 c. rolled oats
1 tbsp. sirup	1 c. wheat flour
1 egg	1 tbsp. oil
¾ tsp. salt	4 tsp. baking powder

Method.—Pour the hot milk over the rolled oats, let stand half an hour. Add the well-beaten egg, sirup, and oil. Then add the dry materials sifted together. Beat hard, turn into well-oiled muffin pans and bake in a moderate oven for ½ hour.

(*Basis for 2 girls, ¼ rule.*)

4. Potato Muffins

1 c. warm mashed potatoes	1 c. milk
1 c. corn meal	2 tbsp. oil
½ tsp. salt	1 egg
4 tsp. baking powder	1 tbsp. sugar

Method.—Same as for Corn Meal Muffins.

5. Cereal Muffins

1 c. barley flour	1¾ c. milk
1 c. corn meal	1 egg
1 c. wheat flour	1 tbsp. corn oil
4 tsp. baking powder	1 tbsp. corn sirup or molasses
1 tsp. salt	

Method.—Same as for Corn Meal Muffins.

(*Basis for 2 girls, ¼ rule.*)

MEAL PLANNING

Class serve a breakfast to invited guests.

HOME PROJECTS

1. Compare the composition of different kinds of flours, using the reference government bulletins.
2. Look up corn and find out what its products are.
3. Prepare one quick bread, using a coarse flour, during the week.
4. Write a recipe for muffins, substituting barley flour and corn meal together in place of wheat flour.
5. Get breakfast on Sunday morning for the family.

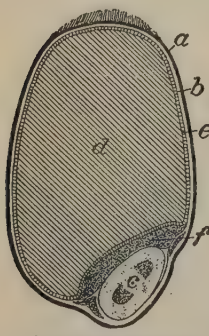
LESSON 17

QUICK BREADS—FLOUR, SOFT DOUGH

Flour is made from cereals—wheat, oats, barley, rye, corn, buckwheat, and rice.

WHEAT

WHEAT has been called the king of cereals, since it is the best for making bread and is cultivated in a greater variety of soils and climates than any other cereal. The value of the world production is greater than that of corn and oats combined. Wheat is second to rice as a world food.



Diagramatic section of a wheat kernel: *a*, bran coats; *b*, aleurone layer; *c*, germ; *d*, body. (U. S. D. A. Bul.)

History.—Wheat was first used in the eastern countries, in the earliest times. Mummies of old Egypt have been found with wheat wrapped in them. It was carried across to the western continents by the earliest explorers.

Kinds.—Wheat is known as (1) spring wheat and (2) winter wheat.

Spring wheat is sown in the spring and matures the same season. This is a hard wheat rich in gluten and is the wheat from which most bread flour is made.

Winter wheat is sown in the fall and harvested the following summer. Hard winter wheat is used for bread flour, soft winter wheat is used for pastry flour.

Structure.—*Bran coats.* There are three coats, or layers, of bran, which contain most of the mineral matter, and all are removed in white bread flour. The protein value of bran is higher than that of the germ and of bolted flour.

Graham flour includes the entire kernel.

Whole-wheat flour contains all but the coarser bran.

The body of the grain, or endorsperm, composed of cells filled with the starch and protein. This nearly surrounds the vital part of the grain, or the germ. It contains only about 11 per cent of the protein of the whole grain.

Germ, the tiny plant that holds the life of the seed. This is removed more or less, in the process of milling, because it makes the flour yellow and on account of the oil which it contains injuries its keeping qualities. Its valuable vitamines are thus lost. It is mixed with bran or middlings and sold as stock feed.

Composition.—Wheat contains all the food principles, and is rich in protein and starch. The whole grain contains 10.2% water, 12.4% protein, 73.4% carbohydrates, 2.1% fat, and 1.9% ash.

Food Value.—Wheat is high in food value. It builds and repairs tissues and gives heat and energy. It is so nutritious, so widely and cheaply grown, and its cooking and baking qualities are so favorable, that it has become the basic food of the people of the civilized world. Wheat bread has been called the "staff of life," but, when made from "bolted" flour, it is notably deficient in dietary factors. Whole-wheat bread, however, is an incomplete food also and needs to be supplemented.

Production and Use.—The world crops of wheat, oats, and corn are all approximately three billion bushels. Nearly one billion is produced in the United States, of which amount the four states mentioned below raise about 38%

Wheat is grown chiefly in the United States, Russia, France, India, the States formerly comprising Austria-Hungary, Italy, Canada, Argentina, and Australia. Kansas, North Dakota, Nebraska and Illinois are respectively the most productive states in this country. The United States and Russia produce about one half of the world crop.

Wheat is used chiefly as a human food both as flour and

in the grain. Bread, macaroni, and a variety of breakfast foods are the principal forms in which it is used.

The by-products of milling, such as bran, shorts, and middlings are fed to stock.

Kinds of Wheat Flour.—(1) Graham flour, (2) whole-wheat flour, (3) bread, or "bolted," flour, (4) pastry flour.

Bread flour is made by grinding the remainder of the grain of wheat after the bran coats and much of the germ are removed. It is the most expensive.

Pastry flour is made from the starchy part of the grain of winter wheat without the outer bran coats and the germ.

Manufacture of Flour.—Wheat is first carefully washed to remove all dust. It is soaked to soften it some, then passed between either millstones or rollers, which grind or crush the grain. There are two chief methods of breaking or grinding the grain, but that used in the best mills for high grade flour is called roller milling. The wheat may pass through as many as eight different sets of rollers, each crushing or grinding finer than the preceding. After each grinding, the fine flour is sifted, or bolted, through silk cloth of different degrees of fineness, and the by-products of bran, middlings, and shorts are produced. Graham and whole-wheat flour are usually ground between millstones, in one operation. The flour is finally packed into sacks, ready for the market. Flour was formerly packed in barrels containing 196 pounds. Practically all flour is now packed in sacks containing 24½, 49, and 98 pounds.

Grades of Flour.—There are many grades of flour made in every mill. The grade depends upon the quality of the wheat and upon the sorting in the milling process. Inferior flour is sometimes sold as best flour, and we pay the price of the best. We must be able to detect poor flour and to demand a grade of flour worth the price we pay. Flour has been found to be adulterated, but there are stringent national laws against adulteration of food products.

Composition of a bread flour is as follows:—

Protein	Carbohydrates	Fat	Mineral matter	Water
11.3%	74.6%	1.1%	.5%	12.5%

How to tell good bread flour:—

1. In color it is white with a slightly yellowish tinge.
2. It feels gritty, not too smooth and powdery.
3. It absorbs water readily.
4. It falls loosely apart after being squeezed in the hand, indicating that it does not contain too much moisture.
5. Good bread flour makes an elastic dough.

EXPERIMENTS

Detecting Starch and Gluten

1. Test flour with iodine for starch.
2. Make a cupful of flour into a stiff dough with a little cold water. Knead in a strainer set in a bowl of water for a few minutes. What washes away? What is the nature of the substance that is left?
3. Test pastry flour in the same way.

SOFT DOUGH

A soft dough is a flour mixture too stiff to be beaten and contains about three times as much flour as liquid. Biscuits are an example of a soft dough mixture.

Materials used for biscuits are the same as for other quick breads.

Dry ingredients include flour, baking powder, and salt. Bread flour is better than pastry flour. All flour must be sifted before using.

Fats may be any of the butter substitutes, butter, or the vegetable oils. Any fat or drippings having strong flavor should not be used for biscuits. The texture of biscuits depends to a great extent upon the amount of fat used. The fat serves to separate the starch particles of the flour in the dough and make the baked product light and tender. When too much fat is used, the texture is coarser and the biscuit falls to pieces easily.

The proportion of fat to flour is 2 tbsp. fat to 1 c. flour.

Liquids are either milk or water. Water serves just as well for plain biscuits, since the fat is also supplied. Milk is used to make a richer dough for desserts such as short cakes. The quantity of liquid used needs to be changed in some cases, depending upon the flour used. Some flours absorb more liquid than others and then more liquid is necessary. Biscuits must be soft as possible to handle without sticking to the board.

Drop biscuits require more liquid and are between a drop batter and a soft dough in consistency.

How to Mix Dry Ingredients.—Measure the dry materials, flour, baking powder, and the salt, and sift them together.

How to Add Fat to Quick Breads.—Fat is added to quick breads by two methods; by melting the fat and adding it to the wet mixture or by cutting or working the fat into the dry materials first before adding the moisture.

Batter mixtures contain a smaller amount of fat and more liquid than doughs. A small amount of fat, when melted, may be blended with a batter without any difficulty.

Soft doughs contain double the quantity of fat of batters. To thoroughly blend the fat in soft doughs the method of working the fat into the dry ingredients first is better.

The fats to be used should be cold. The fat is then rubbed into the dry ingredients quickly, by using the tips of the fingers (never the palms of the hands) until the mixture feels like meal and no fat particles can be seen.

If the hands are warm, then two knives may be used to cut the fat into the dry materials. Use a knife in each hand cutting each way at the same time, or some persons prefer to hold both knives in the one hand and use the blades together. Either method may be used. Almost anyone, however, can learn to rub the fat in with the finger tips, if one works quickly, lightly and deftly enough and it will take less time than to use the knives. Time is always a factor to consider

in your work. One's fingers can be just as clean as knives.

How to Add Liquids.—To add the liquids to the flour mixture after the fat is thoroughly blended use a knife instead of a spoon. A spoon tends to mash the ingredients together. The knife will mix just as well without mashing. The mixture should be stirred as little as possible. Mix only enough to have the moisture evenly blended with the flour. Do this work quickly.

Hot biscuits are best served in a folded napkin or linen square.

As soon as the liquid is added to the dry ingredients some of the carbon dioxide gas is liberated and every care must be taken to keep it in the dough. Handling or stirring the dough causes a loss of gas.

How to Roll and Cut Biscuits.—Sift a slight sprinkling of flour over the center of the molding board before turning the dough on the board. This keeps the dough from sticking to the board.

Small quantities of dough or a quantity made by using the Standard Rule for biscuits may be handled on the board without a rolling-pin. Use a spatula or a thin-bladed knife

to pat (not press) the dough out to an even thickness of one inch. Large amounts may be rolled lightly with a slightly floured rolling-pin.

Cut biscuits with a small biscuit cutter dipped in flour. Cut each biscuit true and close together to get as many biscuits out of the one piece as possible. Pat out the remaining pieces of dough and cut as before. Put biscuits close together on a shallow pan or baking sheet.

Baking Biscuits.—Biscuits require a hot oven. See Lesson 13 for oven temperature. Have the oven hot when the biscuits are ready. Bake biscuits 10-15 minutes on the lower part of the oven. If for any reason biscuits must stand before baking, put them in the ice box until they are to be baked.

Serving Biscuits.—Always serve biscuits hot. A folded napkin or linen square under and over them helps to keep them hot while they are being passed the first time. Those for the second service should be kept hot in the kitchen till needed.

Variations to Biscuit Dough.—Many pleasing variations may be made to biscuit dough. When cooked or fresh fruits and more sugar is added, it makes quick hot desserts. Individual puddings and shortcakes are pleasing changes from one large family size and are more easily served.

SCORE CARD FOR QUICK BREADS

General Appearance		15
Crust	5	
Shape	5	
Size	5	
Palatability or taste		50
Texture		35
Lightness	15	
Lack of excess of moisture	10	
Tendency to crumble	10	
Total		100

QUESTIONS AND PROBLEMS

1. How is the fat added to the flour mixture for making biscuit?
2. Why are knives used to cut in the fat?
3. What difference does the amount of fat in the mixture make?
4. How many biscuits can be cut from the Standard Rule?
5. How can you tell good flour? Give two quick tests.
6. Which quick bread is easiest for you to make?
7. What oven temperature is best for biscuits?
8. How does this differ for muffins?
9. If you needed a bread for dinner in a hurry, which quick bread could be made in the shortest time?
10. When you make biscuit for the night meal at home what other foods can you have at the same time so as to use the same heat for the whole meal?

APPLICATION

Demonstrate Baking Powder Biscuit:—(*a*) Method of cutting in fat. (*b*) Method of handling dough on a board.

Baking Powder Biscuit (Standard Rule)

2 c. flour	4 tsp. baking powder
2 tbsp. fat	1 tsp. salt

¾ c. milk

Method.—Mix and sift the flour, baking powder, and salt. Cut in the fat. Add the milk gradually, to make a soft dough. Transfer to a floured board, and pat or roll out to one inch thickness. Cut with a biscuit cutter. Place close together on a greased pan, and bake in a hot oven 10 to 15 minutes.

(*Basis for 2 girls, ½ rule.*)

VARIATIONS TO BAKING POWDER BISCUITS

Emergency or Drop Biscuit.—Use about 2 tbsp. more liquid with each cupful of liquid and drop the dough into oiled muffin pans and bake.

Cinnamon Rolls or Fruit Rolls.—Pat out the dough to ½ inch thickness, spread with melted butter, sugar, and a little cinnamon. Raisins or chopped citron may be added also. Roll like a jelly roll, cut in inch pieces, put the cut end down on a baking sheet, and bake 15 minutes.

Maple Rolls.—Sprinkle the biscuit dough with maple sugar and roll and cut as for cinnamon rolls.

Date Rolls.—Spread with a paste made by cooking ¼ package of dates with ¼ cupful sugar and ¼ cupful water until like jam. Roll and cut and bake as cinnamon rolls.

Double Biscuits.—Cut the dough in rounds with the cutter, spread with melted butter, put two rounds together, and bake.

Filled Biscuits.—Spread the date paste used in date rolls between the two biscuits and put together and bake as double biscuits.

Luncheon Rolls.—Omit one tsp. baking powder and add one egg in its place. Mix, roll, and cut as plain biscuits. Spread the top of each biscuit with melted butter. Make a crease across the center of each one and fold over like a Parker-house roll. Bake as other rolls.

Nut Biscuits.—Add ½ c. chopped nuts to the biscuit dough, roll and cut as cinnamon rolls.

Dumplings.—Use emergency biscuit dough with only ½ as much fat. Drop by spoonfuls on the top of meat stew. Cover tightly and steam 12 minutes without lifting the cover.

Short Cakes.—Add 2 tbsp. sugar to the dry ingredients. Use 4 tbsp. fat instead of 2 tbsp. and use about 2 tbsp. more milk to make an emergency dough. Drop into muffin pans or spread on one large tin and bake 15 minutes. Split the cake open to make 2 layers. Put a layer of sweetened berries or cooked fruit between the layers and add whipped cream on the top.

Individual Puddings.—Put a layer of any cooked fruit or fresh berries in the bottom of custard cups or little molds. Cover the top with a layer of emergency biscuit dough and bake 25-30 minutes in a hot oven. Turn out of the mold upside down for serving. Serve with cream and sugar. If the fruit has not been sweetened, add sugar to it before putting the dough on the top.

Fruit Dumplings.—Use a little less milk than the rule for biscuit. Use 2 tbsp. sugar with the dry materials. Roll out the dough to ¼ inch thickness and cut in to five-inch squares. Fill the center of each square with half of a sliced apple or sliced peaches or fresh berries. Add ⅛ c. sugar. Wet the edges of the dough slightly; fold so opposite corners meet and press the edges together. Prick the top of the dumpling in several places with a fork and bake in a hot oven 30 minutes. Serve with cream and sugar or fruit sauce.

NOTE: Each group of girls bake some different variation to the standard rule and make a comparison of the finished products.

HOME PROJECTS

1. Make baking-powder biscuits at home for one meal.
2. Make one of the variations to the baking-powder biscuit rule which will be new to the family for one meal.
3. Visit a flour mill, if possible.

LESSON 18

STIFF DOUGHS—BREAD—YEAST

YEAST is a mass of very tiny plants, each plant consisting of a single cell.

Source.—Wild yeast is present in the air and on the skins of grapes. Desirable varieties are cultivated.

Growth.—Yeast plants grow by budding. Each bud breaks away from the parent cell and in turn forms new buds. Under favorable conditions the growth is so rapid that often many buds are formed on one cell at one time, and these in turn are budded before they separate from the parent cell. Under certain conditions yeast forms spores, which grow when they lodge in a favorable place.

Conditions favorable to growth are : (1) Warmth (77° to 95° F. is best). (2) Moisture. (3) Food (starch and a little sugar). Freezing (32° F.) checks the growth. Hot water, or a temperature above 130° F., kills yeast.

Forms.—(1) Liquid, (2) dry, (3) compressed.

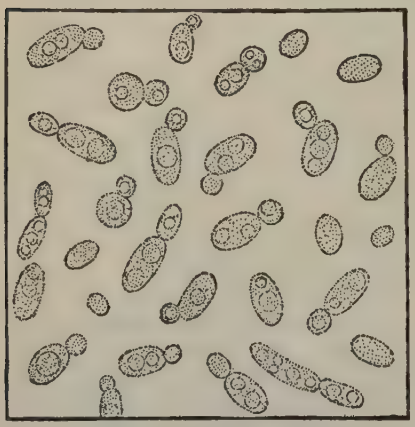
Liquid yeast is not as much used now as in earlier times. It is made from potatoes, hops, sugar, and water. A few yeast plants are added, which feed upon the mixture and multiply very rapidly until the mixture is alive with them. A small amount of this mixture added to dough produces the necessary leaven.

Dry yeast is a market form of yeast. The yeast plants are skimmed from vats of wort, a dilute sugar solution, and are washed, dried, and mixed with starch to keep dry. Then the mass is pressed into sheets which are cut into small squares and put in packages for the market. Dry yeast will keep for a long time and will start to grow only when proper food, heat, and moisture are present again. This form of yeast is convenient for any one living a long distance from market.

Compressed yeast is prepared in the same manner as dry yeast, with the exception that not enough starch is used to keep the yeast dry. The life of the yeast in this case is not entirely suspended, and so compressed yeast cakes must be strictly fresh. If dark spots appear, it means that some of the little yeast plants have died, and the yeast cake will not do as efficient work in raising the dough as fresh yeast.

Compressed yeast is wrapped in tinfoil to keep it moist and free from dust.

Action of Yeast.—When the yeast plant is put into the bread mixture it feeds upon the starch (which it first changes to sugar), and, as it feeds, alcohol and carbon dioxide gas are formed. This change of the sugar is called fermentation. The substance causing the change is a *ferment*. In this case the yeast is a ferment. If fermentation continues too long, the mixture becomes sour. Dough sours when allowed to rise too long or at too high a temperature. When the dough is light enough, the bread is baked. Baking kills the yeast plants quickly, and causes the alcohol to pass out of the bread as vapor.



Yeast Plants (greatly enlarged). (*U. S. D. A. Bul.*)

EXPERIMENTS

Effect of Temperature on Yeast

1. Mix a yeast cake with ½ c. lukewarm water and 2 tsp. of sugar. How can you tell when water is lukewarm?
2. Put a third of the above mixture in a glass. Keep at a freezing temperature for an hour.

3. Put a third of the mixture in a glass and keep at the boiling point for an hour.

4. Put one third of the mixture in a glass and keep at a lukewarm temperature for an hour.

5. Set No. 2 in a warm place for an hour. Notice the change. Examine each one at the end of the hour and write conclusions. Why, in order to have the best results in bread making, should an even temperature be maintained while the dough is "rising"?

Bread is a stiff-dough mixture having a general proportion of about four parts of flour to one part of water.

Ingredients used in bread making are flour, liquid, and yeast. Sugar, fat, and salt are used to flavor it. The *flour* used may be wheat bread flour or part-wheat bread flour combined with whole-wheat flour, Graham flour or meal made from other grains.

On account of the presence of gluten in wheat flour and the lack of it in other flours, some wheat flour must be used in combination with other flours when they are used in making bread with yeast. Wheat bread flour only is used to make white bread. The best grades of flour always make the best breads and the additional cost of some flours is well worth the difference in food value.

Substitute flours may be used in any recipe for breads if the sponge is made with wheat flour and the substitutes added after the first rising.

The liquids are water or milk or half of each. When milk is used, it is scalded to keep it from souring during the warm process.

The water is boiled first to insure it against any bacteria it may contain which might destroy the flavor of the bread.

The yeast may be of any kind. Compressed yeast acts more quickly; but, if dry yeast is started several hours before the sponge is set, the action during the bread rising is just the same. More yeast or leavening power is needed to raise the doughs containing the coarse flours than is needed with all bread flour.

Sugar, when used in small quantities, aids in the growth of yeast. When used in large amounts, it retards the growth.

Salt serves to retard the activity and growth of yeast also. For this reason it is better to add the salt after the sponge rises and just before making the mixture into a dough.

Food Value.—The protein of bread is the gluten of wheat flour. When milk is used as the liquid, this also adds some protein. Gluten is an incomplete protein and while serving the purpose of tissue building in the body must be used with foods containing complete proteins. For this reason bread is used along with protein foods in the meal.

Methods of Making Bread.—There are many ways of making bread, but all come under either of two main heads: (1) slow process or (2) quick process.

In the slow process, mix the ingredients into a batter or a sponge and set to rise until it is full of air bubbles, usually over night. Then add enough flour to make a stiff dough. Knead on a floured board until smooth and elastic. Let rise again until double its bulk. Shape into loaves on the board; let them stand in oiled tins until double their size. Bake in a moderate oven 40 or 45 minutes.

In the quick process, use more yeast. Mix ingredients into a sponge, and beat the sponge hard until it is full of air bubbles. This beating takes the place of one rising. Add enough flour to make stiff enough to knead; turn on a floured board and knead as in slow process. Let it rise once to double its bulk, shape into loaves, double bulk again, and bake. This process takes 5 hours.

Setting the Sponge.—Observe the following directions:—

1. Put yeast to soak in a little lukewarm water. The water dissolves the starch with the yeast and frees the yeast plants so that they act more quickly.

2. Use half milk and water or all water. Half and half makes a richer loaf. All-milk bread dries out rapidly.

3. Scald the milk in the upper part of a double boiler.

4. Put shortening (lard or butter) and sugar in a large earthen bowl.

5. Pour the scalded milk into the bowl and stir all until the sugar and butter are dissolved.

6. Add the water to the ingredients in the bowl.

7. When all is lukewarm, add the dissolved yeast mixture. Stir thoroughly.

8. Add as much flour as liquid, slowly, and beat continually until smooth.

9. Add the salt and enough flour to make a drop batter. Beat this until full of bubbles. This drop batter in bread is called a *"sponge."*

Making the dough.—Continue the work as follows:—

10. Add enough more flour to make the batter stiff enough to handle on a board.

11. Take mixture upon a board, leaving bowl clean.

12. Knead until it is smooth all through and springs back into place when pressed with the finger. Well-kneaded dough does not stick to the hands or board and can be kneaded without using flour on the board.

Kneading the dough causes the gas bubbles to become evenly distributed throughout the mass. When large holes appear in bread they are caused by insufficient kneading or too much yeast.

13. Set in an earthen bowl in a warm place, and cover with a dry cloth. Wet the top of the dough slightly to keep it from getting so dry that it can not rise.

First Rising.—We must then wait for it to rise.

14. When the dough has doubled its bulk, remove from the bowl and knead just enough to shape into loaves. Cut in the right size for loaves.

15. Prepare the pans by oiling thoroughly on bottom and sides. Be sure corners are well oiled.

16. Shape the loaves well; make them the length of the pans and the same width. Some gas is pressed out of the dough

during the shaping into loaves and the loaves need to be allowed time to rise again before baking.

17. Set the pans with bread in a warm place to rise again to double bulk.

Oven Test.—When bread is nearly ready for the oven, test the oven. Bread requires a moderate oven. (See oven tests, Lesson 13.)

A well-molded loaf of bread is smooth and well-shaped.
Courtesy Gold Medal Home Service Department, Washburn Crosby Co.

Baking.—Place pans on lower part of the oven and as near the center as possible.

Small loaves require about 35 minutes; larger loaves (about 4 inches thick), 50 or 60 minutes.

Divide time into quarters as follows:—

1st quarter, bread should rise and begin to brown.

2nd quarter, bread continues to rise and brown.

3rd quarter, it finishes browning and rising.

4th quarter, baking is finished and the loaf draws away slightly from the sides of the pan.

Turn the loaves so that they will brown evenly.

Tests when Done.—Bread draws away from the sides

of the pans when done, and sounds hollow when tapped with the finger.

Care after Baking.—Remove loaves from pans, and turn on the side. If crisp crust is desired, let stand uncovered so the air can circulate around the loaf. If tender crust is desired, rub well with butter or milk.

Good Bread has a fine even grain, with no large holes in it. It has an even, golden brown crust.

Good bread cuts evenly without crumbling and the pieces are of uniform shape.
Courtesy Gold Medal Home Service Department, Washburn Crosby Co.

Uses of Stale Bread.—Stale bread may be used for crumbs scalloped dishes, croquettes, puddings, griddle cakes, and toast. Save and use all left-over pieces of bread.

Crumbs.—Dry the smaller pieces or remnants of bread in a pan in the warming oven until they are crisp, but not brown. Crush the dry pieces with a rolling pin, and sift through a strainer. Put in a glass jar and keep covered until ready for use.

Au Gratin Dishes and Croquettes.—See Lessons 28 and 26.

Puddings and Griddle Cakes.—See Lessons 31 and 13.

Toast.—The larger pieces of stale bread should be saved for toast of various kinds.

Dry toast is freshly toasted bread without butter.

Buttered toast is freshly toasted bread spread with butter and set in a warm oven to melt the butter.

Cinnamon toast is made by adding a little cinnamon and sugar on the top of buttered toast.

Milk toast is made by dipping hot toasted bread into hot salted milk.

French toast is made by dipping in slightly beaten egg and milk and sautéd until brown.

Suggestions to teachers on the method of conducting bread lessons in 2½ to 3 hours

Each girl makes one loaf and works alone.

Preliminary Preparations.—Have double boiler ready, flour measured, and the required amount of yeast at each desk, also pitchers filled with cold water when lesson begins. Scald the milk for the entire class.

Class Management.—Mix the soft batter in the double boilers over lukewarm water. (Allow about 15 minutes.)

Beat the batter and add the rest of the flour. (Allow 10 minutes.)

Demonstrate the kneading. (Allow 5 minutes.)

Class knead the dough. (Allow about 15 minutes.)

First rising—in double boiler. (Allow ½ hour.)

Wash dishes and oil tins while bread is rising.

Demonstrate the shaping of the loaves. (About 5 minutes.)

Class shape loaves and grease tops. (Allow about 10 minutes.)

Second rising takes ½ hour. Baking ½ hour.

General Suggestions.—Use double period for bread lesson.

Aim to have uniform work. One girl can delay the whole class.

Increase the standard proportion of yeast to hurry the lesson.

Hurry the measuring as much as possible.

Hurry the first rising by the use of double boilers.

Hurry the second rising by placing the loaves in the gas range slightly warmed; both the oven and broiling oven may be used.

Guard against overheating of dough.

Small loaves require only ½ hour for baking.

SCORE CARD FOR YEAST BREAD

General Appearance		20
	Size	5
	Shape	5
	Crust	10
	Color Character Depth	
Flavor		35
	Odor	
	Taste	
Lightness		15
Crumb		30
	Character of crumb	20
	coarse—fine	
	tough—tender	
	moist—dry } Texture	
	elastic—inelastic	
	Color	5
	Grain or distribution of gas	5
Total		100

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QUESTIONS AND PROBLEMS

1. Why do we use so much yeast in making bread at school?
2. How does yeast act as a leavening agent?
3. What is needed for the growth of yeast?
4. What does boiling temperature do to yeast?
5. What kind of yeast is used in your home?
6. What does kneading do to the dough?
7. What oven temperature is used for baking bread?
8. Why is the double boiler suggested as a means for hurrying the rising of bread at school?
9. What is the advantage of using compressed yeast? Dry yeast?
10. What temperature must be maintained during the rising of yeast?
11. What substance in wheat flour is necessary to raise mixtures with yeast?
12. Why should the temperature of baking bread differ from that of baking biscuits?

APPLICATION

1. Bread (Slow Process)

1 c. scalded milk	1 tbsp. fat
1 c. cold water	1 tsp. salt
1 tbsp. sugar	¼ cake compressed yeast
About 6 or 6½ c. flour	¼ c. lukewarm water

Method.—Soak the yeast in lukewarm water. Scald the milk and pour over the salt, sugar, and fat in a bowl. When dissolved, add the cold water. When lukewarm, add the dissolved yeast and enough flour to make a drop batter. Beat hard until smooth. This sponge must stand several hours or over night to rise until very light. Proceed as for kneading and baking. (Makes 2 loaves.)

2. Bread (Quick Process)

Use same proportions as above, but increase the quantity of yeast to 1 cake.

Method.—Soak yeast in lukewarm water. Scald the milk and pour over the salt, sugar, and fat in a bowl. Then add the cold water, dissolved yeast, and flour to make a batter. Beat this batter until it is full of bubbles; then add enough more flour to knead on a board. Take upon a floured board and proceed as directed for kneading. This method requires only 5 hours and two risings, one being in loaf. The thorough beating of the sponge takes the place of one rising. (Makes 2 loaves.)

(*Basis for* **1** *girl,* ¼ *rule, with double the yeast for* 2½*-hour method.*)

3. Whole-Wheat Bread

1 cake compressed yeast	2 tsp. salt
¼ c. lukewarm water	½ c. sugar
1 sc. qt. whole-wheat flour	1 pt. warm milk

Method.—Soak yeast cake in the warm water. Sift the flour, salt and sugar; add the warm milk; beat the batter well until smooth; then add the yeast, and beat hard. Gradually add the sifted flour until the dough is stiff enough to be handled on a board. Knead until smooth, place in a greased bowl, cover with a clean cloth, and let stand in a warm place. When double its bulk, shape into 2 small loaves, and let rise a few minutes. Brush with soft butter, and bake in a moderate oven for 45 minutes.

For *nut loaves,* add 1½ cupfuls chopped pecans or walnuts with the flour.

One cupful of chopped floured raisins may be added before the last rising.

4. Graham Bread

1 c. hot water	¼ c. warm water
1½ c. hot milk	¼ cake yeast
⅓ c. molasses	3 c. Graham flour
1½ tsp. salt	3 c. white flour

Method.—Add the hot liquid to the salt and molasses in a bowl, let cool, and, when lukewarm, add yeast dissolved in the lukewarm water. Sift the Graham flour and use only the sifted part. Mix with the white flour and gradually add to the yeast mixture. Beat well, cover and let double its bulk. Beat down again, put into greased pans and let it nearly double its bulk again before baking.

5. Coffee Cake

1 c. compressed yeast	⅓ c. sugar
¾ c. lukewarm milk	2 eggs
1½ c. flour	½ tsp. salt
¼ c. butter	Grated lemon rind
Flour to make stiff batter	1 c. raisins

Method.—Make a sponge of the yeast, milk, and 1½ c. of flour. Beat hard and let rise until light. Then beat well, add the butter creamed with the sugar, the beaten eggs, salt, and grated lemon rind. Wash and flour the raisins and add to batter. Add enough more flour to make a thick batter and beat thoroughly. Let rise once more, beat down and pour into oiled pan. When light, bake slowly. When partly done, spread quickly with a little white of egg and water, and sprinkle with sugar and finely chopped nuts.

When well made, this cake has a close grain and is moist enough to keep several days. It may be baked in deep muffin pans.

HOME PROJECTS

1. Make bread at home on Saturday, using quick process (five-hour) method.
2. Make toast for breakfast every morning during the week.
3. Compile a list of brands of white flour sold in your grocery store, with the price of each for a 49-lb. sack.

LESSON 19

STIFF DOUGHS—ROLLS

Review setting sponge for bread. Review temperatures for yeast and for baking.

The objects of kneading bread and rolls are:—

1. To make the gluten in the dough elastic.
2. To break the large air bubbles, and distribute the carbon dioxide evenly through the dough.

The objects of baking bread are:—

1. To make a more digestible and palatable food.
2. To cook the starch. To expand the gas.
3. To form a crust to hold in the gas.
4. To kill the yeast plants.
5. To drive off the alcohol formed by the yeast plant.

Rolls.—Rolls differ from bread in that they are richer and sweeter. Milk only is used for the liquid and more butter and sugar are added to make them shorter or more tender.

Kinds of Rolls.—A variety of rolls is made from the same sponge, but they may vary in size, in shape, and by the addition of fruit (currants, raisins) or spices (cinnamon).

Baking Rolls.—Rolls require a hot oven for baking (See Baking Chart, Lesson 13, for temperature). A glossy crust or a glazed top is formed on the rolls by brushing the top with milk, milk with a little sugar, or slightly beaten white of egg a few minutes before they are done.

Suggestions to teachers on conducting a lesson on rolls in 1½ hours.

Use twice the amount of yeast. Prepare the sponge before class-time, and let it rise ready for first mixing.

At the beginning of the lesson measure out the light sponge for each desk. (Allow 10 minutes.)

Mix flour into the sponge. (Allow 10 minutes).

Two girls should work together. Knead dough. (15 minutes.)

Demonstrate shaping of rolls. (Allow about 10 minutes.)

Class shape rolls. (Allow about 15 minutes.) Omit the second rising for class work. Let rolls rise in slightly warmed ovens ½ hour.

Class wash dishes. Bake rolls 15 to 20 minutes.

QUESTIONS AND PROBLEMS

1. How does the dough for rolls differ from that for bread?
2. What does baking do to bread and rolls?
3. Why is milk used in place of water in making rolls?
4. Why do rolls require a hotter oven than bread?
5. What is best to do with rolls after taking them from the oven?
6. Which lesson on batters and doughs did you think the most interesting? Why?
7. What is the cost of homemade rolls per dozen?
8. How does it compare with those you buy?

APPLICATION

1. Parker House Rolls (3 hrs.)—(Standard rule for rolls)

2 c. milk	¼ c. butter
1 tsp. salt	1 cake compressed yeast
2 tbsp. sugar	¼ c. lukewarm water

6½ c. flour (more or less)

Method.—Mix yeast with the lukewarm water. Scald the milk and add the butter, sugar, and salt; when lukewarm add the dissolved yeast. Add enough flour to make a drop batter. Beat well and let rise until double in bulk. Add enough more flour to make a stiff dough. Knead and let rise until double in bulk. Roll out to about ⅛ inch in thickness. Cut with a cooky cutter, spread with melted butter, and crease the middle with a knife handle. Fold double, put close together in the pan, let rise until double their size. When ready to bake, brush with milk or slightly beaten egg. Bake in a hot oven 12 or 15 minutes.

(*Basis for 2 girls, ¾ cup sponge.*)

VARIATIONS OF PARKER HOUSE ROLLS

Clover Leaf Rolls

Method.—Use the same rule as for Parker House rolls. For one roll, shape three small balls of dough about an inch in diameter. Place the balls together in an oiled muffin tin. Let rise, and bake as other rolls.

Cinnamon Rolls

Method.—Use the same sponge and method as for Parker House rolls. Roll out sponge to ½ inch thickness, brush with melted butter, sprinkle with sugar and cinnamon. Roll up the dough and cut off rolls an inch thick. Place in buttered pans, let rise, and bake as other rolls.

2. Potato Rolls

1 c. hot mashed potatoes	1 tbsp. sugar
1⅓ tbsp. butter	1 cake compressed yeast
1 c. milk	1 tsp. salt
2 eggs	3½ c.–4 c. flour

Method.—Add the butter, milk, and sugar to the hot mashed potatoes. Set a sponge with the yeast the same as for other rolls. When light, add the salt and mix with remainder of the flour. Let rise and bake the same as any rolls. Serve hot.

HOME PROJECTS

1. Make Parker House rolls and cinnamon rolls at home from the same dough.
2. Make beverages for breakfast or supper every day for one week.
3. Prepare one dish for dinner every day.
4. Set the table for the meals on Sunday.

LESSON 20

GREEN, OR LEAFY, VEGETABLES

Vegetables include most of the plants used for food with the exception of grains and fruits. There are three general classes of vegetables:—

1. *Green*, or leafy, vegetables
2. *Starchy*, or root, vegetables
3. *Legumes*

The chief difference in the classes is due to their difference in composition.

Green vegetables which are chiefly the leaves, stems, and flowers of plants include lettuce, spinach, cabbage, asparagus, celery, water-cress, radishes, onions, brussel sprouts, cauliflower, and tomatoes. Some of these green vegetables have a mild flavor while others have a decidedly strong flavor.

Composition.—All vegetables are made up largely of a network of woody fiber which forms the framework of the plant. This fiber, or cellulose, is much coarser and harder in some vegetables than in others. All vegetables contain a large quantity of water, but green vegetables contain a larger percentage than starchy vegetables. As high as 70% to 90% and over of green vegetables is water.

Mineral salts, especially calcium, iron, and phosphorus exist abundantly in green vegetables.

Green vegetables are rich in all classes of vitamines, especially in vitamine C. Green vegetables contain no fat and practically no protein.

Food Value.—All green vegetables are regulating and health-promoting foods, since they are one of the best sources of mineral salts and vitamines. Green vegetables as far as possible should be eaten in their natural state without cooking, since a large quantity of mineral substance is lost in the cooking water and vitamine C loses its effectiveness when

TABLE SHOWING RELATIVE VITAMINE VALUE OF VEGETABLES

Vitamine A		Vitamine B		Vitamine C	
Poor	Good	Poor	Good	Poor	Good
Cauliflower	Beans, string	Cucumbers	Beans, string	Beans, navy	Beans, string
Celery	Cabbage	Radishes	Cabbage	Cauliflower	Onions
Endives	Carrots	Squash	Cauliflower	Carrots	Peas
Onions	Chard	Fair	Celery	Cress	Spinach
Parsnips	Dandelion	Beets	Eggplant	Dandelion	Excellent
Peas	Lettuce	Carrots	Lettuce	Endives	Cabbage
Potatoes	Peas, shelled	Chard	Onions	Peas, shelled	Lettuce
Rutabagas	Potatoes, sweet	Dandelion	Parsnips	Fair	Rutabagas
Fair	Squash	Potatoes, sweet	Peas, shelled	Beets	Tomatoes
Beets	Tomatoes	Potatoes, white	Rutabagas	Cabbage	
	Excellent		Turnips	Potatoes	
	Spinach		Excellent	Rhubarb	
			Spinach		
			Tomatoes		

Note.—The facts in regard to vitamine D have not yet been sufficiently well established to warrant inclusion in this table.

cooked in boiling temperature. The cellulose of young tender plants is of greater value to the body when crisp and fresh and furnishes bulk in the diet. Cellulose fiber as a whole is only slightly affected by digestion and so retains its bulk, aiding in stimulating the movement of food and the flow of digestive juices. On account of the bulk of all vegetables, concentrated foods like meat, eggs, and bread, having tissue-building properties, should be served with a vegetable dish in the meal plan. The water in which vegetables are cooked contains some of the minerals drawn out in the cooking and should always be used.

Selection and care of green vegetables:—

1. Go to market and make your own selection, if possible. Learn to know the best and buy only the best.
2. Buy green vegetables as direct from the garden as possible, if their best flavor is to be obtained.
3. Select vegetables in season. Vegetables out of season do not have the fullest flavor and are very expensive.
4. See that they are crisp and fresh.
5. Take care of vegetables as soon after being delivered as possible.
6. Wash vegetables in cold water thoroughly, using a small brush for this purpose.
7. Discard any wilted and discolored portions.
8. Drain celery, lettuce, water cress, and radishes, and place in a wet cloth bag in the ice box until ready to use.
9. If greens are wilted, let them soak in cold water awhile to freshen them.
10. Use the outer stalks of celery and coarse vegetables too old to serve plain in cream soups.

EXPERIMENTS

Cooking Green, or Leafy, Vegetables

1. Cook 1 bunch of spinach in 1 pt. of boiling, salted water. Drain off liquid and save.

2. Cook 1 bunch of spinach in a steamer (having holes at the top) over boiling water.

3. Cook 1 bunch of spinach in a steamer (having holes in the bottom) over boiling water.

Compare the spinach in Experiments 1, 2, and 3 as to appearance and flavor. Compare the color of the water in the kettle in Experiments 1, 2, and 3. Is there a difference and what does this show? Examine the vegetable stock in the pan in the steamer in Experiment 2. What does this contain? What is the difference in steamers?

Cooking Strongly Flavored Vegetables

1. Cook ⅛ head cabbage in a steamer over boiling water.

2. Cook ⅛ head cabbage in a kettle in enough boiling water to cover.

3. Cook ⅛ head of cabbage in a kettle with just a little water to keep it from burning.

Compare Experiments 1, 2, and 3 as to the flavor of cabbage. Which is mildest? Which has the strongest flavor? Does the method of cooking make any difference?

Cooking of Green Vegetables.—Proper cooking improves the flavor of all vegetables except those which are eaten raw. Cooking at too high a temperature and for too long a time destroys the flavor and some of the nutrients. In cooking green vegetables heat must be applied in such a way as to preserve their flavor and all their nutrients.

The time for cooking vegetables depends upon the quantity and coarseness of the celluose fiber. Vegetables containing coarse fiber, such as cabbage, require long cooking, while vegetables with tender fiber, such as lettuce, require no cooking.

Cooking in steam and cooking in boiling water are the two ways of cooking vegetables. Cooking in steam retains more of the nutrients than cooking in water. Cooking in steam also retains more of the flavor of vegetables than cooking in water.

Some very young children object to eating vegetables, especially spinach. This objection is due to the flavor. Although steaming is best for retaining all the nutriment,

the flavor is more pronounced. It is better to get children to eat a little than to refuse to eat any. In such cases boil the vegetable in water or even pour off the first water and boil in a second water to overcome the decided flavor. Any child will eat vegetables if they are properly prepared. Serve them with butter and salt.

Cooking in steam is accomplished by using a steamer (having perforations around the top) set over a kettle of boiling water. The vegetables are placed in the steamer and the water in the kettle kept boiling to furnish the necessary steam during the cooking process. If a steamer is one with the perforation in the bottom a smaller pan must be used beneath the vegetable to catch all the vegetable stock (liquids and minerals) drawn out during the steaming. This pan must not cover all the perforation or the steam will not be able to penetrate the vegetable.

Rules for cooking green, or leafy, vegetables:—

1. Steam all mild flavored vegetables.
2. Cook all strong flavored vegetables like cabbage, onions, and cauliflower in boiling salted water deep enough to cover, if a mild flavor is desired. Steam them, if flavor does not matter.
3. Save all vegetable stock in the steamer and use in making soups and sauces.
4. Save all water in which vegetables are boiled and use in the same way. Discard stock and water in which strong flavored vegetables are cooked.
5. If vegetables are cooked in boiling water, always put them on to cook in water that is boiling, never in cold water.
6. If vegetables are steamed, keep plenty of boiling water beneath the steamer.
7. Allow 1 tsp. of salt to each 1 qt. of water.

Allow 1 tsp. of salt to each 8 large vegetables in the steamer.

8. Keep water boiling gently, not rapidly.

9. Add 1 tsp. of acid (vinegar or lemon juice) to water in which cabbage, beets, and greens are cooked, to help soften the fiber.

10. Acid in the water makes red vegetables more red.

11. Alkali water makes green vegetables more green.

Ways of Using Green Vegetables in the Meal Plans:

Serve crisp and fresh with salt. Example—celery and radishes.
Serve singly or in combination with salad dressings.
Serve in combination with other foods in salads.
Cooked and served with butter and seasoning.
Cooked and combined with White Sauce or Tomato Sauce.
Use left-overs in soufflés and soups.

QUESTIONS AND PROBLEMS

1. How many kinds of green vegetables can you name?
2. How many kinds can you recognize?
3. Name two ways of serving tomatoes, onions, spinach.
4. What is meant by acid water making red vegetables more red?
5. Do you eat one vegetable every day?
6. Why should you eat some green vegetable every day?
7. Name a vegetable having coarse fiber.
8. Does your mother steam vegetables in cooking them at home?
9. What is alkali water? Where have you heard of an alkaline substance?
10. What could you add to water to make it alkaline?
11. What vegetable requires an alkaline substance to neutralize some of the acid in it?
12. Do you want to neutralize all the acid in the vegetable?

APPLICATION

1. Spinach

1 pk. spinach	2 tbsp. butter
Pepper	1 tsp. salt

Method.—Wash the spinach; cut off the stem ends and drain off all the water; drop into boiling salted water and boil until tender; then drain and press out all the water; season with butter and pepper and serve hot with vinegar, butter and slices of hard-boiled eggs.

Swiss chard is cooked in same manner.

2. Brussels Sprouts

Method.—Remove outside leaves and cut stem off close. Soak heads in cold salt water for an hour, drain and drop into boiling salted

water. Cook 20 to 30 minutes or until tender. Drain, rinse in cold water, reheat in melted fat and add seasonings.

3. Creamed Celery

Cut celery in half-inch pieces and cook in boiling salted water 20 to 30 minutes until tender. Drain, use the water for soup and add the cooked celery to a medium white sauce and serve.

Cabbage may be prepared in the same way.

4. Stuffed Tomatoes

6 medium-sized tomatoes — 2 tbsp. melted butter
1 c. soft bread crumbs — 1 tsp. salt
1-16 tsp. pepper

Method.—Wash tomatoes. Cut a thin slice from the stem end of each. Take out seeds and pulp and drain off most of the liquid. Mix the crumbs, butter, and seasoning and add to the tomato pulp. Sprinkle the inside of the tomato with salt and pepper. Refill the tomatoes with the mixture; replace the tops. Place in a buttered pan. Sprinkle with buttered crumbs, and bake 20 minutes in a hot oven.

Chopped meat, oysters, green peppers, sweet corn, mushrooms, or celery may be added to the filling

(*Basis for 2 girls, ⅙ rule.*)

5. Cauliflower and Tomatoes

Method.—Soak the cauliflower in cold water, head down, for ½ hour. Cook in boiling salted water or steam for ½ hour. Drain, and place the head on a hot serving dish. Serve with Tomato Sauce.

6. Tomato Sauce

2 tbsp. butter — ½ tsp. salt
2 tbsp. flour — 1 c. strained tomato
Pepper

Method.—Make according to white sauce using the strained tomato in place of milk, or use half tomato and half milk, and add a speck of soda to keep it from curdling.

HOME PROJECTS

1. Make a list of vegetables with the comparative cost of each as found in your local market. Do you think that the cost is in proportion to the food value?

2. Do marketing of the vegetables for the dinners at home for one week.

3. What vegetables are raised in your locality? Make a list of them.

4. Prepare one vegetable for at least two dinners during the week.

LESSON 21

✓ STARCHY, OR ROOT, VEGETABLES

Starchy vegetables differ from the green, or leafy, vegetables in composition and also in the part of the plant from which they are derived.

Starchy vegetables are chiefly the roots, tubers (or enlarged roots), and the bulbs, with a few fruits of plants. They include white potatoes, sweet potatoes, beets, carrots, parsnips, corn, turnips, squash, oysterplant, pumpkin, and rutabaga.

Composition.—Starchy vegetables, or root vegetables, contain a large amount of starch together with much cellulose, mineral salts, and water. They contain some vitamines.

The roots, tubers, bulbs, and seeds of plants are the storehouse for starch for the plant and serve the same purpose to the young growing plant as the cereals do. Most of this stored-up food supply is in the form of starch and a little is in the form of sugar. The mineral salts and vitamines are not as abundant in this type of vegetables as in the green, or leafy, class. Mineral salts exist in the layers directly under the skin of most of the starchy vegetables, especially in the potato. The center is made up of many cells having cellulose walls filled with starch and water.

The Irish, or white, potato is the most commonly used starchy vegetable. This preference is due partly to its lack of pronounced flavor and to its food value. It is a tuber, or an enlargement of the underground stem.

Potatoes are healthful and are easily and thoroughly digested. They furnish 12.5 per cent of the average American diet.

Composition.—Potatoes contain—

Water, about ¾ their weight. They may, then, be baked, since they contain enough water to soften the starch.

Starch, about ⅕ their weight.
Protein, about 2.5 per cent.
Cellulose, which forms the walls of the cells.
Mineral matter, which is mainly potash salts.

Structure.—The potato is made up of cells with thin walls of fiber, and these cells contain starch grains and water. Surrounding the mass of starch cells and just beneath the skin is a layer of nutritious mineral matter and protein material. This is wasted if the potato is peeled too thickly.

Manner of Growth.—Potatoes are grown from cuttings, each cutting planted producing several tubers beneath the soil. They are best when fully matured; those immature are soggy when cooked. Large potatoes are likely to be hollow at the center. Smooth roundish ones are preferable for peeling, as there is less waste, and medium-sized ones require less heat for baking.

The Sweet Potato.—The sweet potato, which is an enlarged root, is a warm-climate plant and is grown in the United States as far north as New Jersey. It is as common in the South as the white potato is in the North.

While the sweet potato is somewhat higher in food value than the white, it may be regarded and treated similarly. It contains about 26 per cent of starch and sugar, of which 10 per cent is sugar, about 69 per cent water, and 1.3 per cent cellulose, thus requiring more time for cooking.

Yams are the tropical substitute for the potato. These roots are larger, similar in structure, but coarser and less palatable than either the white or the sweet potato.

Food Value of Starchy Vegetables.—On account of the large quantity of carbohydrates (starch and sugar) in these vegetables they are one of the chief energy-producing foods.

Storage of Starchy Vegetables.—Some starchy vegetables like potatoes may be kept many months in a cool, dark dry place. Potatoes should not be allowed to sprout. Sprouts use some starch and moisture and lessen the food value.

Sweet potatoes do not keep as well as the white potato and can not be shipped or stored in such large quantities. Beets, parsnips, turnips, and rutabagas may be stored for a considerable time in the home cellar, where it is cool and dry. Sometimes they are covered with sand. Green tomatoes may be wrapped separately and ripened later by exposing to sunlight. Most vegetables can be stored in cold storage vaults for many weeks and months. Some institutions having cold storage facilities often keep vegetables and berries fresh and sound well into the winter months.

EXPERIMENTS

Cooking Starchy, or Root, Vegetables

1. Pare a potato. Boil it in water to cover until done.
2. Boil a potato without paring it until done.
3. Clean and boil a carrot until tender.
4. Scrape a carrot and boil until tender.
5. Drain the water off the vegetables, keep each portion separate, cool, and test with iodine for the presence of starch in the water.
6. Boil the water down in each case to see whether any substance remains. Any residue that remains is mineral matter, or ash, which has been drawn out in the cooking.

Compare the results and determine which is the best method of cooking starchy vegetables, with skins on or off? Which retains the most flavor?

Cooking in Boiling Water or Steam

7. Pare a potato and cut into quarters. Steam over hot water in a steamer until tender.
8. Scrape a carrot cut in quarters and steam over hot water until done. Save the water in the bottom of the steamer, boil it down to see whether there were any minerals lost in this method.

Taste the vegetables. How do they compare in flavor with those cooked in boiling water? With those cooked with the skins on? Can you taste any difference?

How does the potato in Experiment 7 compare with a baked potato?

9. Hold a cold plate over the steam of the teakettle, then remove and see what happens to the steam on the plate. Compare the similarity of the steam on the cover of the kettle in which potatoes are cooked with the moisture on the plate. Is there any reason for leaving the lid off the kettle after the vegetables are drained?

Cooking Starchy Vegetables.—Starch, as we learned in Lesson 5, requires long thorough cooking at a high temperature in the presence of moisture to soften it. Starchy vegetables require moisture and a 212° boiling temperature applied for some time to properly cook their starch contents. Too high a temperature and too long cooking destroy their effectiveness and flavor.

In order to properly cook starchy vegetables the heat must be applied in such a way as to (1) Soften the cellulose and starch, (2) Preserve the mineral salts, (3) Preserve their flavor.

This result may be accomplished by—

- Baking.
- Cooking in steam.
- Cooking with skins on in boiling water.

Baking.—Vegetables containing a large amount of water as potatoes, may be baked in their skins, since the water is converted to steam by the heat of the oven. This steam within its skin breaks down and softens the starch cells. When baked potatoes become cold, the steam condenses back to water and the starch of the potato becomes soggy and heavy.

If the skin is broken or pricked so the steam passes off, the potato is dry and fluffy. Pricking the potato to test it before it is done lets out some of the steam and delays the baking.

To test baked potatoes to tell whether they are done, press them between the fingers. If done, they are pliable and give to the touch.

Baking in a casserole or a covered dish is an excellent means of cooking mild flavored vegetables to preserve their flavor and nutrients. Pare thinly and put in the dish with a small amount of water. When done, serve with butter, salt, and pepper.

Cooking in Steam.—Steam, when under pressure, has a

higher temperature than boiling water. The starch in the vegetables is better cooked in steam than in boiling water. Large vegetables may be cut up to save time in cooking and yet not lose the food nutrients that are lost when vegetables are peeled, cut up, and cooked in boiling water.

A steam-pressure cooker may be used for cooking the starchy or root vegetables better than for cooking the green vegetables.

Cooking in Boiling Water.—When vegetables are cooked in their skins in boiling water all the nutrients are retained. The minerals which lie so close to the skin are not lost as when vegetables are peeled. When the vegetables are done, the thin skin may be removed easily and all the food value of the vegetable remains.

Ways of using starchy vegetables in the meal plans:—

Small new vegetables may be cooked whole and served with melted butter and seasoning. The butter adds flavor.

White potatoes, sweet potatoes, and squash may be baked.

Cooked vegetables put through a ricer served with seasonings.

Cooked, mashed, and seasoned.

Cooked vegetables may be sliced and sautéd a nice brown.

Cooked, diced, and combined with white sauce or minced and used in soufflé.

Creamed vegetables combined with crumbs and baked.

Left-overs used in soups, stews, hash, or croquettes.

Serve singly or in combination with other food and a salad dressing in a salad.

Vegetables for dinner are best served with seasonings and butter.

Vegetables for luncheons are better served in cream sauces.

Rules for selection of starchy or root vegetables are very much the same as for green vegetables.

Rules for cooking vegetables are in general:—

1. If vegetables are steamed, have the water below the steamer boiling hot. Add more water as needed to keep up the steam during cooking.

2. If vegetables are boiled, put the prepared vegetables into freshly-drawn boiling salted water.

3. Allow 1 teaspoonful salt to each quart of water.

4. If vegetables are steamed, add the salt to the vegetables in the steamer.

5. Let old vegetables that are wilted stand in cold water an hour before cooking to restore some of their moisture. Young vegetables are best pared just before cooking.

6. Remove the eyes and dark spots before cooking.

7. Pare vegetables thinly, if pared.

8. Cook vegetables gently and steadily when cooked in boiling water. Rapid boiling wears off the outside before the inside is done.

9. Cook vegetables having strong odors uncovered in boiling water.

10. Test boiled and steamed vegetables with a long darning needle to tell when they are tender.

11. Test baked vegetables by pressing with the fingers.

12. When vegetables are done, drain off all the liquid or stock into a bowl. Let starchy vegetables stand uncovered in a warm place a few minutes before serving. The steam and moisture will pass off.

13. Save all vegetable stock for uses in soups and sauces.

14. Season vegetables, butter and serve them very hot.

15. Do not always serve the same vegetable in the same way. There are many different ways.

The time for cooking starchy vegetables depends on the kind, size, amount of cellulose fiber, and the age of the vegetables. A person can not depend too much on a time-table for cooking vegetables, but the following guide gives a general idea of the time to allow.

TIME-TABLE FOR COOKING VEGETABLES

Asparagus.....30 to 45 min.	Onions.....40 to 60 min.
Beans, (string).....1 to 2 hrs.	Parsnips.....1 to 2 hrs.
Beans, (lima).....1 to 1½ hr.	Potatoes.....20 to 40 min.
Beets.....1 hr.	Peas.....30 to 40 min.
Cabbage.....1 to 2 hrs.	Spinach.....20 to 30 min.
Cauliflower.....½ hr.	Squash (summer)..30 to 45 min.
Carrots.....30 to 40 min.	Turnips.....40 to 60 min.
Corn (green).....15 to 20 min.	

QUESTIONS AND PROBLEMS

1. When potatoes are boiled and drained, what difference does it make to let them stand uncovered a few minutes?
2. What becomes of steam after it condenses?
3. Is it a good plan to cut pieces out of the skin of potatoes if they are to be baked?
4. What kinds of potatoes are best for baking?
5. Is it wise to test potatoes with a fork to tell whether they are done?
6. What makes potatoes turn dark when peeled?
7. Which is best, to cut a baked potato open or to break it open?
8. Do you cut open or break a biscuit?
9. Is there any different result in the two ways?
10. Name two good dinner vegetables.
11. Why are dinner vegetables better served with seasoning and salt?
12. Why are creamed vegetables best served for luncheon?
13. What would a creamed vegetable add to the food value? How do you buy potatoes, by the pound, peck or bushel?
14. What is the legal number of pounds of potatoes in one bushel? Does your grocer sell by measure or by weight? What way is better for you?
15. What food principle is lacking in potatoes?

APPLICATION

1. Boiled Potatoes

Method. Select potatoes that are smooth and of uniform size. Wash and pare them. Cook them in boiling salted water until soft. Test with a fork; if it withdraws easily, the potatoes are done. Allow 1 tbsp. of salt to every 7 potatoes and enough water to cover. Drain off the water and let stand uncovered in a warm place until served. Serve hot. Potatoes may also be scrubbed well and boiled with the

skins on or steamed. Carrots, turnips and onions are prepared in the same way. Serve with butter.

(*Basis for* 2 *girls*, 1 *potato.*)

VARIATIONS OF POTATO RULE

Riced Potatoes

Method.—Put cooked potatoes through a hot potato ricer and serve at once. Do not pack or mash in putting into the serving dish. Add seasoning.

Creamed Potatoes

Method.—Cut the boiled potatoes in half-inch cubes. Make a medium white sauce according to first method and combine with the potatoes while hot. Add the finely cut parsley and serve.

Mashed Potatoes

2 tbsp. butter
6 boiled potatoes
4 tbsp. hot milk
½ tsp. salt
Pepper

Method.—Mash the cooked potatoes with a potato masher or a fork until soft, add the butter, salt, pepper, and the milk, and beat all until light and foamy. Serve piled lightly in a hot serving dish.

Potato Cakes

Method.—Press cold mashed potatoes into small round cakes ½ inch thick. Brush over with milk, and sauté in butter until a rich brown on both sides. Sautéing is cooking in a small quantity of fat.

2. Baked Potatoes

Method.—Select smooth, medium-sized potatoes. Wash well with a small vegetable brush kept for the purpose. Bake in a hot oven about 45 minutes or until done. Test with a fork. Break the skins to let the steam escape, and serve at once. If baked potatoes stand, they become soggy.

3. Stuffed Potatoes

6 medium-sized potatoes, baked
2 tbsp. butter
½ tsp. salt
4 tbsp. hot milk
2 egg whites
Pepper

Method.—Cut the end from each baked potato, or cut in half lengthwise, scrape out the inside with a fork, and mash the center with a fork. Season it with the salt, pepper, butter, and milk. Add the beaten white, reserving part for the top. Fill skins with mixture, brush over the top with the egg and return to the oven until browned.

Grated cheese may be sprinkled on the top for a change. Minced meat may be added to the potato. Ham or chicken would be good.

(*Basis for* 2 *girls*, 1 *potato.*)

4. Sweet Potatoes

Method.—Cook sweet potatoes with the skins on. They may also be mashed, riced, or baked.

5. Glazed Sweet Potatoes

Method.—Wash and pare 6 medium-sized sweet potatoes. Cook in boiling salted water 10 minutes. Drain, cut in halves lengthwise, and put into a buttered baking dish. Make a sirup by boiling 1 c. sugar with ½ cup of water 3 min., then add 1 tbsp. of butter. Brush the potatoes with the sirup, and bake 10 to 15 minutes until tender. Baste the potatoes with the sirup once or twice while baking.

6. Boiled Beets

Method.—Select small young beets. Wash, and cook them in boiling salted water without peeling, until tender,—about one hour. When done, put in cold water and rub off the skins. Slice them and serve with salt, pepper, butter, and vinegar.

HOME PROJECTS

1. Prepare potatoes for dinner two nights next week.
2. Prepare one other starchy vegetable.
3. Find out the cost of new potatoes compared with old potatoes.
4. Make a list of starchy vegetables you know.

LESSON 22

LEGUMES

Legumes are a class of plants having seed pods which contain seeds used for food. They include peas, beans, lentils, peanuts, soy beans and cowpeas.

Composition.—Vegetables, both green and starchy, belong to the carbohydrate class of foods. Legumes while containing considerable carbohydrates (starch and sugar) belong to the protein class of foods. This difference is due to the fact that legumes have the power to take up nitrogen from the air and made it over for their own use. Nitrogen is the element essential in proteins for tissue building.

Legumes contain about 23-25 per cent protein, mostly in the form of legumin. Dried legumes contain very little water and fat.

Food Value.—The legumes have a high food value and are classed with meat and cheese as a tissue-building food. The legumin, or protein substance, is quite similar in many ways to casein in milk, and it has been called a vegetable casein. Unlike casein, it is not a complete protein and does not build tissue or support life when used alone. Peas, beans, and lentils must be used in combination with or at the same time with other protein foods in order to serve the body as tissue builders. They are very much like the protein of cereals in this respect; but legume seeds are much richer in protein than the cereal grains.

Soy beans are an important food in the diet of the people in China and Japan and are grown to considerable extent in the United States. The protein of soy beans is a complete protein and can support growth when they form the sole supply of protein. With foods containing butterfat (vitamine A) and mineral salts of calcium and potassium, they become a well-balanced food of great value in the diet.

Peanuts contain complete protein and considerable more fat than other legumes and need not be used with other foods rich in protein. Peanuts are used extensively in making peanut butter. They are grown in the South and are used there for feeding hogs. Peanuts are deficient in mineral salts and in vitamine A.

Dried peas and beans are sold at comparatively low price per pound and in this form are a cheap source of proteins in diets where meats are too expensive. They are an excellent substitute for meat when combined with eggs, milk, or cheese, and should be served as the protein dish of the meal. It is not necessary to have meat every day. Many persons live wholly on a vegetable diet.

Cooking Legumes.—The essential points to consider in cooking dried legumes are:—

1. To restore flavor and moisture lost in the drying.
2. To soften cellulose fiber.

Rules for cooking:—

1. Soak dried peas, beans, and lentils in water for 10 to 12 hours to restore the moisture before cooking them.
2. Cook them a long time at moderate heat to soften the fiber. Too long cooking at a high temperature tends to break up and mash them.
3. Add ½ teaspoonful of soda to each quart of water in which dried legumes are cooked, to neutralize the strong acid which they contain and aid in softening the cellulose.
4. Pour off the water after 10 minutes boiling, add fresh boiling water to cover, and cook until tender.
5. A fireless cooker or a pressure cooker saves fuel and is an excellent means of cooking legumes a long time at the right temperature.
6. When fireless cookers are used, always have the water boiling before placing the food in the compartment and see that the radiator is the right temperature. Use the cooker for the final long period of cooking (3 to 4 hours).

Ways of using legumes in meals:—

In soups.

In soufflés.

Combined with crumbs and White Sauce to form a loaf and baked.

QUESTIONS AND PROBLEMS

1. Compare legumes with cereals for composition. For protein.
2. Compare legumes with dried fruits in manner of preparation.
3. How are peanuts grown?
4. How is peanut butter made?
5. How much water would 1 cupful of dried beans absorb?
6. How can you divide an egg for ¼ rule?

APPLICATION

1. Pea Soufflé

1 c. split dried peas or	1 tsp. salt
1 c. canned peas	4 tbsp. milk

4 egg whites

Method.—Look over and wash the peas in cold water. Let dried peas stand over night in old water to cover. Put in a kettle and bring to a boil. Drain, cover with fresh boiling water, and boil 1 hour. Press through a sieve, add the salt, pepper, and milk. Beat the egg whites stiff and fold into the pea mixture. Butter a baking dish, turn in the mixture and bake in a moderate oven 20 minutes. Serve as soon as removed from the oven.

(*Basis for* 2 *girls,* ¼ *rule.*)

2. Lima-Bean Loaf with Bacon

¼ lb. thinly sliced bacon	1 tbsp. grated onion
3 c. lima beans	1 tbsp. parsley
1 tsp. salt	1 egg
⅛ tsp. pepper	2 tbsp. egg crumbs

1 c. cream sauce

Method.—Wash and soak the beans over night; drain; cover with boiling water; cook until tender; drain, and mash through a coarse strainer; add seasonings, egg well beaten and cream sauce. Keep 1 tsp. of beaten egg for top of loaf. Mix all together. Brush a baking pan with drippings, fill with the mixture, brush top with beaten egg and sprinkle with bread crumbs. Bake in a moderate oven 40 minutes. Turn out on a platter and garnish with bacon curls and parsley.

(*Basis for* 2 *girls,* ¼ *rule.*)

3. Baked Beans

1 qt. beans	1 tsp. soda
1 hp. tsp. salt	1 tsp. mustard
1 tsp. ginger	2 tbsp. N. O. molasses

½ lb. sliced bacon

Method.—Soak beans over night. In morning add fresh hot water to cover and soda and cook 15 minutes. Pour off the water, add the other ingredients, cover with fresh water, and bake in covered jar 4 or 5 hours. Remove the cover the last half hour.

4. Salted Peanuts

Method.—Blanch ¼ pound of shelled peanuts in boiling water a few minutes and then remove the skins. Put ⅓ c. olive oil or corn oil in a shallow pan and set in a hot oven. When hot, add the peanuts and cook until a delicate brown, stirring to keep the peanuts from burning and so that they will brown evenly. Remove from the pan, drain on plain paper, and sprinkle with salt. Be careful not to use too much salt and shake off all that is loose before serving. Pecans and almonds may be salted in the same way.

5. Fresh Peas

Method.—Shell peas just before using, look them over carefully and put in a kettle containing enough boiling water to cover. Boil slowly until tender. Add butter, salt and pepper, and serve hot.

6. Canned Peas

Method.—Canned peas should be opened at least one hour before using. The air helps to restore their natural flavor. Turn out of the can as soon as opened. Cook in a saucepan, with 1 tbsp. of butter and salt and pepper to taste, for 5 minutes, when, if of good quality, they will be done. Peas and diced carrots make a nice combination.

HOME PROJECTS

1. Prepare one legume for dinner for meatless meal once during the week.
2. Find out the cost of each kind of legume per pound.
3. How does this compare with round steak cost per pound?
4. What do peanuts cost per pound?
5. Paste on a chart for the school room cuts of fireless cookers and steam-pressure cookers. Collect from advertisements.
6. Prepare two vegetables besides the legume during the week.

LESSON 23

SOUPS WITHOUT STOCK

Kinds.—There are two kinds of soup: (1) soups with stock and (2) soups without stock.

Soups with stock have as a basis the juices of meats.

Soups without stock have as a basis milk or cream, together with the pulp of vegetables. There are three divisions of soups without stock:—

Cream soup, made of vegetables or fish together with milk, cream, and seasoning or with a thin white sauce.

Purées are made of boiled vegetables or fish put through a strainer, together with a thin white sauce. These contain more vegetables than the cream soups and are, therefore, thicker.

Bisques are made of shellfish or vegetables with a thin white sauce, and are served with fish dice.

Materials used for soups without stock include:—

Vegetables cooked and put through a ricer or strainer.

Liquids: Whole milk, skim milk, or half milk and half vegetable water.

Seasoning, salt, pepper, paprika, celery salt, onion juice, chopped parsley. Bacon fat gives it a little flavor. Celery stalks and leaves may be dried and kept for this purpose. All outside stalks are just as good for flavoring as the hearts of the celery. Throw nothing away that may be used.

Vegetables best suited in flavor for soups:—

Green vegetables, as tomatoes, asparagus, celery, spinach, cauliflower.

Onion should be used for flavoring only.

Starchy vegetables, like potatoes, corn, and carrots.

Legumes, like peas, beans, and lentils.

Tomatoes require special precautions to prevent the acid from curdling the milk. The soda is used to neutralize part

of the acid. If too much is used, it spoils the flavor of the tomato and gives it a flat taste.

Left-over vegetables or those too old to serve whole are good for use in cream soups. They make an economical dish, as well as a very nourishing one. Removing the hard cellulose fiber by forcing the pulp through a strainer makes cream soups very easily digested.

Soups without stock, when allowed to stand, separate; that is, the vegetables separate from the milk or cream, unless bound together. The best way of binding materials is by using a thin white sauce.

General proportions for cream soups, or soups without stock are: About one half as much vegetable pulp as white sauce, plus the seasoning—salt and pepper.

Proportions for *thin white sauce*:—

2 tbsp. butter Salt and pepper
1 tbsp. flour to 1 c. of milk

If the vegetables contain a large amount of starch, use less flour. If lacking in starch, use from 1 to 3 tbsp. of flour.

General directions for soups without stock:—

1. Cook the vegetables in water until very soft; then press them through a vegetable press or strainer. Add the water in which the vegetables were cooked.

2. Make the White Sauce in a double boiler, using Method 2.

3. To make the soup richer, use part cream instead of all milk, or add beaten egg or two spoonfuls of whipped cream to the soup just before serving.

4. Combine vegetable pulp and white sauce and serve. Do not let soup stand long, as it is likely to thicken.

5. Serve soups very hot.

6. Serve crisp crackers or toasted bread in sticks or cubes with soup.

Food Value.—Soups without stock have a higher food

value than soups with stock. The milk or cream of the white sauce furnishes the protein to build and repair tissue and the vegetables contain starch and mineral substances. Soups are easily digested, are nourishing, and are appetizers for the courses that follow.

QUESTIONS AND PROBLEMS

1. What is the soda used for in making tomato soup?
2. Why is the tomato added to the white sauce instead of the white sauce poured into the tomato?
3. What combination of vegetables give the best flavor to soups?
4. How many persons will 1 quart of soup serve?
5. How would you have to change the recipe for your family?
6. What would be the cost of pea soup made with 1 pint of peas?
7. Would cabbage make good soup?

APPLICATION

1. Cream of Pea Soup

1 pt. can of peas	1 tsp. sugar
1 pt. cold water	1 qt. thin white sauce

Method.—Boil the peas in the water until soft. Rub them through a coarse strainer or vegetable press, and to the pulp add the water the peas were cooked in. Combine a thin white sauce with the peas.

(*Each* 2 *use* ⅔ *c. white sauce and* ½ *c. peas.*)

2. Cream of Corn Soup

1 pt. can of corn	1 slice onion
1 pt. cold water	1 qt. thin white sauce

Method.—The method is the same as in Cream of Pea Soup.

3. Cream of Potato and Cream of Celery Soup

Method.—These are both made with the same proportions and in the same way as Cream of Corn Soup.

(*Each* 2 *use same basis as in* 1.)

4. Cream of Tomato Soup

1 c. tomatoes	1 pt. milk
¼ tsp. soda	2 tbsp. butter
2 tbsp. flour	1 tsp. salt
	Pepper

Method.—Cook the tomatoes for 10 minutes. Remove from the fire, strain, and add the soda. Return to the fire and keep hot until ready to serve. Make a thin white sauce of the rest of the ingredients. Keep sauce hot until ready to serve. Immediately before serving

pour the tomato into the white sauce. This soup will curdle if combined too long.

(*Basis for 2 girls, ⅔ c. white sauce, ⅓ c. tomatoes.*)

5. Croutons

Method.—Cut slices of bread ½ inch thick; then cut into cubes. Put in the oven and toast to a delicate brown. Serve with soup.

(*Housekeepers prepare croutons for class.*)

HOME PROJECTS

1. Make Cream of Tomato Soup for dinner one day.
2. Bake beans on Saturday.
3. Prepare one cream soup for luncheon on Saturday.

LESSON 24

OILS—SALADS

Salads originally consisted of crisp, green vegetables dressed with oil, vinegar, salt, and pepper. To-day salads are made of raw or cooked vegetables, fruit, meat, or eggs, separately or in combination, with a salad dressing.

The essentials in salad making are:—

1. Salads must be cold. All greens used must be crisp, and dry.
2. The ingredients in the dressing must be carefully blended and not be too strong of either acid or oil.
3. The whole must be well mixed just before serving.
4. Materials must be nicely cut and arranged.
5. The combination of ingredients must blend well in flavor. Like foods used together.
6. The salad should combine with the other foods served at the meal to form a balance in foodstuffs.

Points in favor of salads as a frequent dish in the diet:—

1. Salads have considerable food value, since the greens used furnish the body with needful mineral salts and furnish roughage in food. The dressing contains oil and acid.
2. Fresh vegetables and fruit salads are healthful and appetizing dishes.
3. Meat salads contain much food value and may be substituted for the meat dish.
4. Salads may be made an economical dish, as much left-over food may be used.

Materials Used for Salads.—Any left-overs of fresh, green or cooked starchy vegetables, fish, fresh fruit, cooked meat or eggs may be utilized very advantageously in a salad. The combinations must be simple and blend together well in flavor and color. It is usually better to combine fruits together or vegetables together than to mix fruit and

vegetables. Celery, onions, nuts, pimientos, peppers or hard-cooked eggs may be added to almost any combination of food materials in a salad. All material for salads must be cut into uniform-sized pieces and be as dry as possible before adding the dressing. Fruits containing much juice should be drained and combined at the last minute. Cooked vegetables must be drained from the cooking water and green vegetables must be crisp. Eggs, fish, and meat should be cut in whole pieces, not mashed or soft. Meat, fish, and canned vegetables, when used for salads, are mixed more evenly with the dressing and have a richer flavor when marinated before adding the dressing.

To marinate, mix each material separately with a little French dressing and let stand an hour before combining and adding the mayonnaise dressing. Chicken for salad is always marinated and combined with the other ingredients a while before adding the oil dressing.

Greens used for garnishing salads are lettuce, water cress, parsley, nasturtiums, or celery.

Wash greens thoroughly in cold water. If wilted, let lie in cold water an hour, dry in a towel, roll up carefully in a damp cloth, and put on ice until ready to use.

Lettuce is used by itself for a salad or as a garnish with salads. Either leaf or head lettuce is used. Head lettuce is easier to use and makes a better looking salad than leaf lettuce. It may be cut into quarters or eighths if the head is large and served in individual portions without separating the leaves, or the leaves may be taken apart and a nest formed to furnish the garnish and hold the portions of salad. When a salad is served at the table individual portions arranged in little nests of lettuce may be placed on a large chop plate and make attractive and easy servings. Leaf lettuce when large is best cut or shredded for use as a garnish. To shred lettuce, roll the leaf and cut into narrow strips with scissors. Leaf lettuce may be used under salads

as a garnish or to garnish a cold meat platter. Young leaf lettuce is also used alone as a salad, usually with a French dressing or just vinegar and sugar.

Celery tops when fresh are used to garnish meat and vegetable dishes as well as salads. Cut off the roots and leaves, use the outer stalks for making soups or as creamed vegetable. Use the crisp center by cutting into quarters lengthwise and serve as "club style" or separate each stalk.

To curl celery cut each stalk into 3-inch lengths. Cut down the ends 1 inch deep into thin strips. Then cut lightly

A salad service showing the arrangement at the hostess' cover.

through the outer fiber of the stalk at the base of the slashes so that the pieces may curl. Let stand in ice water several hours until the ends curl. Curled celery makes an attractive garnish for salads.

Salad Dressings.—Classes of salad dressing are:—

French dressing,—used principally with crisp greens and vegetable salads, but may be used with almost any combination of salad materials.

Cooked dressing,—used with any kind of salad.

Mayonnaise dressing,—used with almost any kind of salad, but especially with egg, meat, and fish.

The acid in salad dressings wilts salad greens, if allowed to stand, and fresh green salads and garnishes must be combined only a few minutes before serving time to be best.

French and mayonnaise dressing contain salad oils. Cooked dressing does not contain oil.

Oils Used for Salad Dressings.—An oil is a fat that is liquid at ordinary temperature. Oils become solid at low temperatures. Oils are obtained mainly from the vegetable world and include olive oil, corn oil, cotton-seed oil and oil from nuts. Oil from olives is always sold under the name of

A stuffed tomato salad as arranged in individual servings on large salad plate.

olive oil. Oil from corn, cotton-seed and nuts is used in many commercial products and sold under trade names.

The food value of olive oil is the same as that of other vegetable oils, but olive oil has a more pronounced flavor than corn or cotton-seed oil.

The flavor of vegetable oils, corn and cotton-seed, is bland and, when combined in right proportions in salad dressings, is not pronounced and is just as good as olive oil and not nearly so expensive. All oils used for salads should be sweet and fresh. Rancid oil should never be used.

EXPERIMENTS

Blending Oil with Liquids

1. Put 1 tsp. oil in ⅛ c. water. Shake or stir the mixture.
2. Put 1 tbsp. oil in a cup. Add 1 tsp. vinegar. Stir together and let stand.

Compare and note whether oil is soluble in water or vinegar.

Oils do not mix with liquid substances readily and a salad dressing made of oil and vinegar will separate when allowed to stand. French dressings must be stirred, beaten or shaken in a bottle before serving to blend the ingredients.

Mayonnaise dressing is a thick smooth dressing made of oil which does not separate so readily and may be made so as not to separate for several days.

Oil to blend smoothly in a liquid must have the globules of oil very finely separated by some material so that they form an emulsion. Milk is an example of an emulsion. The fat or cream being finely divided throughout the milk.

In the making of mayonnaise dressing the yolk of an egg is used as a basis for making an emulsion with the oil. The egg yolk is slightly mixed, then the oil is added slowly while beating the mixture. The particles of oil become finely divided and coated with egg which forms an emulsion.

An emulsion is formed more rapidly when the oil and egg are cold and also when all the acid is added at the beginning of the process. If the oil is added too rapidly at first without the acid, the fat particles are not divided sufficiently and the mixture separates or curdles instead of emulsifying.

One egg yolk will emulsify one cup of oil or,—
One whole egg will emulsify two cups of oil.

When mayonnaise is made in large quantities for commercial use a base is used for binding the dressing together and to prevent separation. This base may be made with flour or cornstarch for the binding material.

What to Serve with Salads.—Serve crisp crackers, cheese wafers, cheese straws, small sandwiches, nutbread, or small

slices of angel food spread with preserved figs and rolled as a jelly roll, or salad rolls.

QUESTIONS AND PROBLEMS

1. What other combinations of salads can you name?
2. Which salad dressing is the best for children?
3. Which salad dressing is the richest?
4. Should little children eat salads?
5. Can you name any other place where an emulsion occurs?
6. Can you tell any difference in the taste of olive oil or corn oil?
7. Which is the most expensive?
8. What are some trade names used for corn oil, cotton-seed oil?
9. What food classes are represented in the following salads:—chicken salad? head lettuce with French dressing? tomato-cucumber salad? fruit salad with cooked dressing?
10. Why should all salad material be dry before combining?

APPLICATION

1. French Dressing

General proportion,—
⅓ as much vinegar as oil and
1 tsp. salt with 1 c. oil or

⅓ c. vinegar	1 tsp. paprika
1 c. oil	¼ tsp. pepper
1 tsp. salt	2 tsp. sugar

Method.—Put all the ingredients together in a bowl. Beat with a spoon until thick. Pour into a serving bowl or bottle. Beat the mixture or shake the bottle each time before using.

2. Boiled Dressing

1 c. weak vinegar	½ tbsp. salt
Yolk 6 eggs*	½ tbsp. mustard
½ c. sugar	Red pepper, a pinch
1 tbsp. butter	Whipped cream

Method.—Heat the vinegar and butter in a double boiler. Beat yolks in a bowl slightly. Mix mustard, sugar, salt and pepper together, and add to yolks; beat well. When vinegar is hot, pour it slowly over the beaten yolks in the bowl, stirring constantly to prevent cooking of eggs, making a smooth mixture. Return all to double boiler and cook until thick, stirring while it thickens. This dressing may be kept

*Fewer eggs may be used by substituting ½ tbsp. flour for each egg yolk omitted.

several days or a week if placed in glass jars and kept in a cool place. Just before using add whipped cream.

(*Basis for* 2 *girls,* ⅓ *rule.*)

3. Mayonnaise Dressing

½ tsp. mustard	1 egg (yolk)
1 tsp. salt	2 tbsp. lemon juice
1 tsp. powdered sugar	2 tbsp. vinegar
A few grains cayenne	1 c. vegetable oil

Method I—Mix the dry ingredients, add the egg yolk, and when well beaten add ½ tsp. of vinegar. Add a drop or two of olive oil and beat constantly. Continue adding oil a few drops at a time as the mixture thickens and becomes of uniform consistency. When the mixture becomes quite thick, add lemon juice or vinegar alternately with the oil, until all is used, always beating the mixture.

(*Basis for* 2 *girls,* ¼ *rule.*)

Method II.—Put the egg yolk, dry ingredients, and acid in a deep bowl; then add ½ c. of oil. With a rotary beater beat the mixture hard for several minutes until it thickens and begins to hold its shape. Add another half cup of oil and beat hard again for a minute or two; then add the remainder of the oil and beat hard for several minutes until the mixture is stiff and smooth. If the base is used, beat it into the finished mayonnaise at this stage. The base must be cold before adding. Put the dressing in a glass jar with a good top and set in the ice box until serving time. To serve put the quantity to be served in an attractive dressing bowl and serve with a ladle. Method II depends upon the thorough beating to make it successful. This method is quicker and better, when once mastered.

If mayonnaise curdles during the making, it is a simple matter to remedy. Begin over with another egg yolk and use the curdled mixture the same as oil. Beat constantly and add mixture very slowly at first.

Whipped cream, when stiff and thick, makes a pleasing addition to cooked and mayonnaise dressings. Fold it into the dressing just before blending dressing with the salad materials.

Use the whip from ½ c. cream with 1 c. salad dressing.

Base for Mayonnaise Dressing

3 tbsp. cornstarch	1 tsp. salt
¼ c. cold water	¾ c. boiling water

Method.—Mix the cornstarch with the cold water until smooth. Add the boiling water and salt. Cook until smooth and thick. Cool, and fold into the finished mayonnaise.

4. Thousand Island Dressing

1 c. mayonnaise	1 tbsp. chopped pimientos
½ c. olive oil	1 tbsp. chopped green peppers
1 tbsp. tarragon vinegar	1 cooked egg yolk sifted
¼ tsp. paprika	1 tbsp. walnut catsup
1 tbsp. chopped chives	⅓ c. chili sauce

Method.—Make the mayonnaise and keep in a cold place until ready to use. Chop the ingredients fine, blend with the oil and seasoning, and keep cold. When ready to use, add the chopped mixture to the mayonnaise quickly and carefully and serve on quarters of clean crisp heads of lettuce.

SALAD SUGGESTIONS

Mayonnaise, or cooked, dressing may be used with the following combinations:—

1. 1 c. apples, 1 c. celery, ½ c. walnuts (Waldorf salad).
2. 1 c. pineapple, 1 c. bananas, ½ c. white cherries.
3. Bananas rolled in chopped nuts.
4. Prunes stuffed with pecans, whipped cream.
5. 1 c. celery, 1 c. apples, green peppers.
6. 1 c. grapefruit, 1 c. marshmallows, 1 c. white grapes, ¼ c. nuts.
7. 1 c. pineapple, 1 c. marshmallows, 1 c. white cherries.
8. 1 c. oranges, 1 c. Bermuda onions.
9. 1 c. peas, 1 c. cheese, cut in small cubes.
10. 1 c. lobster, 1 c. celery.
11. Tomato stuffed with cooked sweetbread, mayonnaise dressing.
12. 1 chicken, an equal amount of celery (about 1½ c.), ¼ c. olives, ½ c. nuts.
13. 1 c. cooked chicken, 1 cucumber, 1 c. walnuts, 1 c. peas.
14. Sweetbreads, 1 pt., equal amount of cucumbers.
15. 1 c. olives cut lengthwise, 1 c. almonds cut the same.
16. Canned pears cut in halves, shredded almonds. Place almonds in the pears like quills in a porcupine. Serve on lettuce, one for each guest.
17. 2 c. salmon, 1 c. celery, cut fine, ½ doz. sour pickles.
18. Head lettuce and Roquefort cheese.
19. Sliced hard-boiled eggs, cucumbers, celery, and lettuce.
20. 1 can strained tomatoes, ⅔ box gelatin, 1 tsp. salt, 1 tsp. powdered sugar. Make a jelly, put into molds, serve on lettuce.
21. Cooked macaroni cut in inch lengths, sliced pickles, or stuffed olives.
22. 1 pt. beets, 1 pt. cabbage, ½ c. horseradish.
23. Tuna fish, celery, olives.

24. Frozen fruit salad of pineapples, white cherries, candied red cherries, and Malaga grapes. Add 1 tbsp. dissolved gelatin to one cup of boiled or mayonnaise dressing. Fold in the whip from one pint of cream. Then fold in the fruit cut in even pieces. Put in mold. Pack in salt and ice for four hours. Slice and serve with lettuce garnish. Any of the sweet or preserved fruits may be used.

French Dressing may be used with the following combinations:—

1. Sliced tomatoes, green peppers, celery and cucumbers.
2. Water cress.
3. Endive, Roquefort cheese.
4. Green peppers stuffed with creamed cheese sliced crosswise, and lettuce.
5. Cooked asparagus stalks in green pepper rings, and pimientos.
6. Whole string beans, sliced radishes, and pimientos.
7. Sections of grape fruit, cut dates lengthwise, head lettuce, and much paprika in the French dressing.
8. Dates stuffed with creamed cheese sliced, salted nuts.
9. Equal parts oranges and grape fruit sections.

HOME PROJECTS

1. Prepare French dressing and use with one fresh green vegetable salad for dinner once next week at least.
2. Prepare a salad for lunch or supper once during the week.
3. Make a list of salad greens in season at this time.
4. Plan the salads to serve during the week. Serve one every day, if possible.

LESSON 25

FATS—FRYING UNCOOKED MIXTURES

Fats constitute a class of foods which serve as heat and energy producers. Fats are ordinarily solid and become liquid only in the presence of heat. They are not soluble in water, but in ether, chloroform, carbon bisulphide and gasoline.

The class of fatty foods include both fats and oils.

Sources.—Fats and oils used in cooking are obtained from animals and vegetables. Examples of *animal fats* are cream and butter, meat fat (suet, marrow, and drippings), lard, tallow, and fish oil.

Examples of *vegetable oils* are olive oil, corn oil, cotton-seed oil, cocoanut oil and oils from other nuts.

Composition and Food Value.—Fats and oils are composed of the same chemical elements as carbohydrates, namely, carbon, hydrogen, and oxygen and serve the same purpose of energy producers in the body. Fats contain less oxygen and more carbon and hydrogen and thus give about twice as much heat and energy as carbohydrates.

Being lighter and more compact than carbohydrates (starch and sugar), they serve the body better as a medium for storing up energy for future use. This is in the form of fatty tissues of the body. Body fat, or adipose tissue in animals, is formed from carbohydrates as well as from fats. The fat in animals differs widely in form. The fat in older animals as a rule is softer than in young animals. The fat nearest the surface is softer than that which surrounds the organs of the body. Land animals have harder fats than water animals and animals of the herbaceous kind have harder fats than the carniverous animals.

Fatty foods are used by people in the arctic regions as the principal food source of heat. Generally speaking, they are used during cold seasons in larger quantities than during

the warmer seasons. Fatty foods should be used sparingly in diet of persons who have any difficulty with digestion. Butterfat and cod liver oil are rich in vitamine A. It is thought that many of the other fats contain some of this vitamine, but not in any great quantity. The same kind of fat or oil at different times and under varying conditions may contain different quantities of vitamines. In animal fats this variation is thought to be due in a large measure to the kind of feeding of the animals.

Butter and cod liver oil are essential fats for the proper growth and development of very young growing children.

Butterfat.—Butter is a popular fat in America and northern Europe for table use on bread and with vegetables. In some countries olive oil is the chief fatty product used for both cooking and ordinary table use. In others tallow drippings are used and in countries where rice furnishes the principal grain for a large population, various fats and oils are used instead of butter.

The popularity of butter is due mainly to its pleasing flavor. It has about the same fuel value as other fats, but is much more expensive. To use much butter as a fat in cooking is extravagant. The other fats serve the purpose just as well and at a much less cost, but lack the lactic flavor of butter. Other fats lack flavor and a little more salt is necessary than when butter is used. Butter burns very easily and is not used for deep fat frying.

Butter substitutes are compounds made by mixing and churning other fats than butterfat with milk or cream until it becomes an emulsion of the consistency of butter. Oleomargarine, nut margarine, and vegetable oils are the chief butter substitutes.

They are as nutritious as good butter, the taste is not unpleasant and they are much less likely to spoil. Margarine was first discovered or invented in France during the Franco-Prussion War in 1870 and was the result of an urgent

need of an economical food source of fat at a time when cattle fat was being rapidly destroyed. It was at first used entirely as a butter substitute, but has become such an established product that it can hardly be said to be a substitute any longer.

The proportion of the different fats and milk varies greatly according to the quality of the product. Any proportion of fats may be used, but any mixture of butter and other fats must be sold in America under the name of oleomargarine. The name oleomargarine was adopted for the product in this country to signify that a large amount of oleo fat was used in its manufacture. Nut margarines are a later product made from oil of cocoanuts, peanuts, and cotton seed. They do not contain any oleo oil and, while conforming to the law compelling them to be sold as oleomargarine, are in reality misbranded as such. Federal legislation regulates the manufacture and sale of oleomargarine, and places a tax of 10¢ per pound on colored oleos. To avoid this prohibitive tax oleomargarines are sold uncolored and then taxed only ¼¢ a pound. Harmless color tablets may be purchased with the margarine and the color worked into the product in the home, if butter color is desired.

Animal Fats.—In animals, fat is found in layers under the skin, around the kidneys, vital organs, joints, and in all tissues as well as in the blood. Fats contain three substances:—stearine, (which is solid), palmitin (which is semisolid) and olein (which is liquid). When a fat contains more of one of these substances than of another its nature is different. For example, tallow, the fat from beef or mutton, contains more stearine than other substances and is, therefore, a hard, solid fat.

In the preparation of edible fat for market animal fat is rendered by subjecting it to a temperature of about 110° F. The connective tissue separates from the fat which melts and is taken off. The fat is then sold as lard, leaf lard,

tallow, and suet, depending upon the animal and the part of the animal from which it came.

Lard is nearly pure fat obtained from pork.

Leaf lard is fat from around the kidney of pork.

Suet is hard fat obtained from beef.

Tallow is the fat obtained from beef or mutton. The fat of lamb or mutton is very hard and, having a strong flavor, it is not used as a cooking fat.

Drippings are the melted fats from any meat.

Lard substitutes are usually made of a mixture of beef fat and vegetable oil. These compounds or mixtures of different kinds of fats are sold under trade names for practically the same price as lard. They are just as good for cooking purposes as lard. Where the product is hard, white, and without odor, better results are obtained, especially in the making of pastry than when lard is used. Vegetable oils, when used in place of solid fats for cooking purposes, require a little different method of combining ingredients, but give very good results.

Whenever it is found desirable to substitute vegetable oils for solid fats, it must be remembered that a considerably smaller quantity must be used than that stated in the recipes.

EXPERIMENT

To Detect Butter from Butter Substitutes

Heat 1 tbsp. of fat in a small dish until it boils rapidly, then stir it. Butter boils without much noise and foams up. Butter substitutes boil with much noise, have little foam and spatter like hot fat when water is dropped into it.

To Try Out Fat.—Beef drippings, leaf lard, etc., must be tried out, or freed from the connective tissue, before they can be used for frying. Cut the fat fine, put into a pan with enough water to cover, and set it in the oven. Let it simmer several hours. When the fat is melted and free from water, strain through cheesecloth and cool. Try out leaf lard in a double boiler; strain, and cool.

To Clarify Fat.—Fat used in frying takes up water, solid substances, and flavors that should be removed before the fat is used again. To clarify fat, melt it and add a few slices of raw potato. Heat gradually and allow to simmer, to evaporate the water. When it ceases to bubble and the potato is well browned, strain through a cloth over a strainer into a lard-pail or jar. The potato takes up odors, and the solid substances are strained out.

New fat should be used for batter and dough mixtures, potatoes, and fish balls. After these, fry fish, meat, and croquettes.

Frying is cooking in deep fat. Fats used for frying are the vegetable oils, (corn oil, cotton-seed oil,) lard substitute compounds, lard or a combination of two thirds lard and one third beef suet. This combination, and the lard substitutes give better results than all lard in frying.

The temperature to which a fat will rise, its flavor, and cost are all factors for consideration in the choice of what fat or combination to use.

Tests for Frying Temperature.—To prevent absorption of fat by foods when fried, the fat must be hot enough to form a crust over the food as soon as put in. The fat is never hot enough until it ceases to bubble. Then test by dropping in an inch cube of bread cut from the middle of a slice.

For *cooked mixtures*, like croquettes, or for fish and oysters, the bread should turn a golden brown in 40 seconds.

For *uncooked mixtures*, like fritters and doughnuts, the bread should turn a golden brown in 60 seconds.

Cautions in Frying.—1. Do not let fat get so hot as to smoke badly.

2. Do not fry too large a quantity at one time, as the temperature of the fat is thus lowered.

3. Drain fried foods on soft paper to absorb the fat.

4. Use egg and crumbs to cover mixtures that are likely to absorb too much fat.

QUESTIONS AND PROBLEMS

1. What fat is used in your home for frying?
2. Why are fried potatoes difficult to digest?
3. What other method of cooking potatoes is better than frying or sautéing?
4. What butter substitutes can you name?
5. What are some common trade names for lard substitutes?
6. What are some of the common trade names for cooking oils?
7. Compare cost per pound of the various cooking fats.
8. How can you tell when fat is hot enough for frying doughnuts?
9. What makes some doughnuts soggy and soaked with fat?
10. What can be done to prevent this condition?

APPLICATION

1. Doughnuts (sour milk)

2 eggs	3 c. flour
1 c. sugar	1 c. sour milk
1 tsp. soda	1 tsp. salt
1 tbsp. melted fat	2 tsps. baking powder
½ tsp. cinnamon	Season with vanilla or nutmeg

Method.—Put the flour, spices, soda and baking powder, and sugar in a bowl. Beat the eggs until light and add the milk and melted fat. Add the wet ingredients to the dry. Handle as lightly as possible. Roll out to ¼-inch thichness, cut, and fry in deep fat. Do not put in more than five doughnuts at a time or the fat will be cooled too greatly. Let the fat reheat between fryings. Turn the doughnuts while frying; drain on plain paper. This recipe makes 3 dozen doughnuts.

(*Basis for* 2 *girls,* ¼ *rule.*)

VARIATIONS OF THE DOUGHNUT RULE

Chocolate Doughnuts are made by adding 4 teaspoonfuls of chocolate to the preceding rule.

Sour Cream Doughnuts:—Use sour cream in place of sour milk. Omit the melted fat in the rule.

Sweet Milk Doughnuts:—Use sweet milk in place of sour milk. Omit soda and use 4 tsp. baking powder instead of 2 tsp.

Method.—Same as for Sour Milk Doughnuts.

2. Potato Doughnuts

1 c. mashed potatoes	½ c. sweet milk
1½ c. sugar	2 eggs
2 tbsp. melted fat	3 c. flour
3 tsp. baking powder	Nutmeg grating
½ tsp. salt	½ tsp. cinnamon

Method.—Beat the eggs and add the sugar. Mash the potatoes and put them through a strainer; add the butter and milk and put through the strainer again. Add eggs and sugar, and then the flour to which has been added the baking powder and a pinch of salt. Roll out to ¼ inch thick, cut, and fry as other doughnuts. This recipe makes 3 dozen.

(*Basis for 2 girls, ¼ rule.*)

3. Corn Fritters

1 can corn	½ c. flour
1 tsp. baking powder	1 tsp. salt
¼ tsp. paprika	2 eggs

Method.—Chop the corn; add dry ingredients mixed and sifted well. Then add the beaten yolks of eggs and fold in beaten whites. Fry by spoonfuls in fresh hot lard; drain on a paper.

(*Basis for 2 girls, ¼ rule.*)

4. French Fried Potatoes

Method.—Wash and pare the potatoes and cut into eighths lengthwise. Let soak in cold water 1 hour. Drain and dry between towels. Fry in deep fat until an even brown. Drain on plain paper and sprinkle with salt. If the fat is too hot the potatoes will brown before they are thoroughly cooked.

5. Fritter Batter

2 eggs	2 tbsp. of vegetable oil
1 c. flour	½ c. cold water
1 tsp. salt	1 tsp. sugar, if for sweet fritters

Method.—Stir salt in egg yolk, add oil slowly, then sugar, and when well mixed stir in the flour slowly. Then add the water a little at a time. Beat well, set aside for 2 hours, then stir in beaten whites of eggs. Batter must be thick. If not soft enough, add white of another egg.

(*Basis for 2 girls, ½ rule.*)

Note.—Oranges, bananas, prunes, apples, and clams or oysters may be used with this batter.

Fruit.—Cut fruit in quarters, roll in powdered sugar, and dip in batter before sugar has time to dissolve. Fry like doughnuts. Roll in powdered sugar just before serving. Serve hot.

For Clams or Oysters.—Use 1 tablespoonful of lemon juice or vinegar and use liquor of clam or oyster instead of water in the batter.

6. Swedish Timbales

¾ c. flour (about)	½ c. milk
½ tsp. salt	1 egg
1 tsp. sugar	1 tbsp. vegetable oil

Method.—Beat the egg thoroughly and add the milk and oil. Sift the dry ingredients together, add the wet to the dry; beat until smooth.

Frying.—Heat the fat as for doughnuts; use a deep dish and hold the iron in the hot fat until thoroughly heated through. Dip the hot iron into the batter to within ¼ inch of the top. Place immediately in the hot fat deep enough to cover the iron. If the iron is *too hot*, the batter will slip off into the lard. If *too cool*, the batter will stick to the iron. Fry to a delicate brown, and drain on plain paper. Use for creamed peas, mushrooms, and finely-cut salmon or chicken. This recipe makes 3 dozen timbales.

(*Basis for 2 girls, ⅓ rule.*)

HOME PROJECTS

1. Prepare sour milk doughnuts once during the week.
2. Plan and serve a breakfast one morning, using poached egg on toast with doughnuts, fruit, and a beverage.
3. Clarify the fat used for frying doughnuts, if it is not new fat.
4. Look up the subject of making soap and how to use left-over fats for making cleaning soap in the home.

LESSON 26

√ FATS—FRYING COOKED MIXTURES

Cooked mixtures to be fried must be held in shape with some binding material, then rolled in egg and crumbs. The egg forms a coating which prevents food from absorbing fat.

Croquettes are mixtures of meat, fish or vegetables with a thick white sauce for a binding. The whole is rolled in egg and crumbs and fried in deep fat. Left-overs of meat, vegetables, or fish are easily and daintily used in this way.

General Proportions for Croquettes—Use about half as much thick white sauce as meat or vegetables. Soup stock may be used for liquid in place of milk in the white sauce to give it a richer flavor.

General Method.—Put meat, fish, or vegetables to be used through a meat chopper and mix with the thick white sauce. Cool the mixture and then form into shape. Croquettes may be in the form of balls, nests, cones, or cylinders. About 2 tablespoonfuls make the right size. Roll the croquettes in egg and crumbs and fry in hot fat until a nice brown, drain on soft paper, and garnish with parsley or jelly.

To Crumb Food for Frying.—Either bread or cracker crumbs may be used. Crumbs from the inside of the loaf make a more even, delicate brown surface, when fried, than crumbs which include the crusts. Dried crusts, when trimmed, may be used in bread puddings or au gratin dishes.

Dry stale bread thoroughly in the oven, then roll it with a rolling-pin until it is fine like meal. Sift it in a strainer and use the fine crumbs for crumbing croquettes and chops. If crumbs are too coarse, they will fall off food when fried instead of clinging to it. Food to be fried must be perfectly dry before dipping in egg or the egg will not adhere to it enough to hold the crumbs.

The whole egg is best for coating. Allow 2 tablespoonfuls

of water to each egg. Beat eggs thoroughly and add the water. Strain before using in order to insure an even coating of egg. Sprinkle each piece of food with salt, pepper, and paprika, and then roll in fine crumbs. Dip each piece in the egg mixture and coat evenly, then roll again in crumbs. Place in ice box until time for frying. Any food which is coated with egg and crumbs for frying may be prepared several hours before time for frying, if it is more convenient to do so. Food does not absorb the fat as much if the egg coating is cold and firm before frying.

Veal cutlets are crumbed in the same manner as croquettes, but are sautéd instead of fried in deep fat, since veal requires a longer time for cooking.

Baking Croquettes.—Croquettes may be baked in the oven in a deep pan or casserole instead of frying. Place them in the casserole, add bits of butter to the top of each or pour 2 teaspoonfuls of melted butter or a good vegetable oil over the top. Add a little water to cover the bottom of the pan. Cover and bake in a moderate oven 20-30 minutes.

Serving Croquettes.—Croquettes of meat or vegetables lacking in decided flavors are best served with a tomato sauce. Most croquettes may be served with a white sauce or a border of peas or potatoes and a sprig of parsley as a garnish. Fish croquettes are accompanied with a slice of lemon or lemon cut lengthwise into eighths. Tartar sauce may be used with fish croquettes. Always serve croquettes hot.

To add different flavoring to croquettes:—

1. Add chopped parsley to crumbs for croquettes of potato or meat.

2. Add brown sugar to sweet potatoes before shaping in croquettes.

3. Add dry mustard to the crumbs used for the first crumbing of fish or meat croquettes, using ½ teaspoonful of mustard to 1 cupful of crumbs.

4. Add grated cheese and paprika to crumbs used for

coating oysters or fish croquettes, using 1 cupful of grated cheese to 1 cupful of crumbs.

Use corn meal in place of crumbs for small fresh fish, as brook trout, scallops, or smelts.

Sautéing is cooking in a small amount of fat. This is a common method of cooking meat and vegetables, especially left-over portions of cooked food.

To sauté food add 1 tablespoonful of fat in a frying pan. When hot, add the articles to be cooked and stir or turn occasionally until brown and well cooked. Season and serve. Foods that are sautéd are more difficult to digest than those cooked in deep hot fat, for the reason that the temperature of the fat is not as high as when the food is covered with the fat and also because no eggs are used to prevent the absorption of fat. Most foods have a better flavor, are more easily prepared and are more thoroughly digested if baked in the oven. Oven cookery can be and should be used for most of the foods which are commonly sautéd.

Too much fat and too low a temperature in cooking makes food greasy and very difficult of digestion.

Digestion of Fat.—The softer fats and emulsified fats are digested more easily than those which are hard and require a high degree of heat to soften them. A fat containing much stearin is more difficult to digest than a mixture of fats containing olein with the stearin. Heating fats to too high a temperature in cooking decomposes them and produces substances which irritate the membrane of the stomach. Fat is not acted upon in the mouth nor in the stomach. The length of time food stays in the stomach is regarded as a guide to the ease with which it is digested. Much fatty food retards the secretion of the gastric juice and so delays the digestion of protein foods which fact accounts for the common idea that fats are difficult to digest. Fats enter the intestine without being changed. Here they are broken up into tiny globules by the action of the bile together with a

special ferment in the pancreatic juice called *steapsin*. This forms an emulsion of the fat which is readily absorbed through the cell walls. Foods which are fried are hard to digest. Proteins and carbohydrate foods are partially digested before reaching the intestine. When fried they are surrounded by a coating of fat and this is not dissolved until they reach the intestines, so that they escape digestion almost entirely and are not made available to the body.

The pancreatic juice does its best to digest all the classes of food; but, as it was not intended to do all the work, much of the food is passed on without being made available to the body. Fried potatoes are especially hard to digest, as they contain so much starch. Starch grains must absorb water, swell, and burst before they can be digested. When coated with fat the starch grains can not take up moisture and burst and by the time the fat coating is dissolved in the intestine the digestion of starch can not be completed.

Too much fat for proper digestion may come from excessive quantities of butter, cream, or oil in other foods than those which are fried. Pastry and other foods rich in fat should, therefore, be used sparingly.

Fats are not decomposed by bacteria in the digestive tract as readily as are the protein and carbohydrate foods.

QUESTIONS AND PROBLEMS

1. Why are croquettes rolled in egg and crumbs before frying?
2. What is the binding substance in croquettes?
3. How can you tell when the fat is hot enough to fry croquettes?
4. Why do you drain fried foods on soft plain paper?
5. Which takes longer to fry, cooked or uncooked mixtures?
6. How does the temperature of fat for frying compare with the temperature of water at boiling point?
7. Why should fried foods be put into hot fat for frying?
8. Why is the egg beaten slightly and water added to it before croquettes are dipped into it?
9. Why do crumbs fall off croquettes sometimes when fried?
10. How many ways could you use ½ c. of left-over canned peas?
11. What would be two nice ways to use left-over salmon for lunch?

APPLICATION

1. Potato Croquettes

2 c. hot riced potatoes	1 tsp. parsley chopped fine
2 tbsp. fat	½ tsp. salt
⅛ tsp. pepper	¼ tsp. celery salt
Yolk of 1 egg	A few grains of cayenne

Few drops onion juice

Method.—Mix ingredients in order given and beat thoroughly; shape, dip into crumbs, into egg, and then into crumbs again. Fry in deep fat and drain on brown paper.

(*Basis for* 2 *girls,* ¼ *rule.*)

2. Meat Croquettes

2 c. chopped meat	½ tsp. salt
⅛ tsp. pepper	A few grains cayenne
A few drops onion juice	Yolk of 1 egg

1 c. thick white sauce made of white soup stock instead of milk

Method.—Mix ingredients in order given, cool, shape, dip into crumbs, into egg, roll again in crumbs, and fry the same as other croquettes.

(*Basis for* 2 *girls,* ¼ *rule.*)

3. Chicken Croquettes

1¾ c. chopped cold fowl	¼ c. thick white sauce
¼ tsp. celery salt	½ tsp. salt
1 tsp. lemon juice	A few grains pepper
1 tsp. parsley chopped fine	A few drops onion juice

Method.—Mix ingredients in order given; cool, shape, crumb, and fry. Garnish with a sprig of parsley on top

(*Basis for* 2 *girls,* ¼ *rule.*)

4. Salmon Croquettes

1¾ c. salmon (flaked)	¼ c. thick white sauce
A few grains pepper	1 tsp. lemon juice

Salt

Method.—Same as for other croquettes.

5. Rice Croquettes

½ c. rice	½ c. boiling water
1 c. scalded milk	½ tsp. salt
Yolk of 1 egg	1 tbsp. butter

Method.—Wash the rice, add to water with salt, and steam until rice has absorbed water. Then add the milk, stir lightly with a fork,

cover and steam until rice is soft. Remove from the fire. Add the egg and butter. Spread on a plate to cool. Shape, roll in crumbs, roll in the form of nests, dip into egg, then into crumbs, fry in deep fat, and drain. Put a cube of jelly in the hollow of each croquette.

(*Basis for* 2 *girls,* ¼ *rule.*)

6. Cod Fish Balls

1 c. salt codfish
2 c. potatoes
1 egg
½ tbsp. butter
Pepper

Method.—Pick the codfish into small pieces and soak in lukewarm water until soft. Boil and mash the potatoes, season with butter and pepper, and add beaten egg. Drain the fish, add to the potato mixture, and beat well. Take up by heaping tablespoonfuls and shape into balls; fry about six at a time in deep fat. Drain on brown paper. Garnish with parsley and serve.

(*Basis for* 2 *girls,* ¼ *c. codfish.*)

HOME PROJECTS

1. Prepare croquettes once during the week, using a left-over of meat or vegetable from dinner.
2. Prepare one hot bread or a hot dish for the dinner each day.
3. Prepare a salad for at least three meals during the week.

LESSON 27

CANDIES AND BONBONS

Review Sugar—Lesson 10

French candies have for their basis a mixture of sugar and water boiled together, then worked until it becomes a smooth cream. This candy is called Fondant. Fondant may be combined with candied fruits, nuts, colorings, flavorings, cocoanut, angelica, or chocolate to make many attractive varieties.

Equipment and materials for making French candies:—

Large porcelain kettle.

Porcelain table top or a marble slab with fitted iron rods around the edge or a large platter.

Wooden paddle.

Paraffin paper.

Cane sugar, and flavorings.

Vegetable colorings.

It is economy to buy granulated sugar in quantity, since a fraction of a cent is saved on each pound. Cane sugar gives better results than beet sugar in making fondant. All sugar should be white and perfectly clean.

Vegetable coloring comes in paste or liquid form. The paste is better for candies and does not add moisture. All coloring must be added very sparingly. Beginners are likely to spoil candy by adding too much color. Only delicate tints are best. To add coloring:—Put in very little at the edge of the mass to be colored, and gradually work it into the fondant smoothly until it is all blended evenly. In this way, when the right tint is obtained, any excess coloring may be easily removed from the outer edge.

Flavoring, like coloring matter, should be delicate and so combined that it blends in to form a rich, delicate cream without being too pronounced. There is more danger of

spoiling French candies by the use of too much flavoring and too high coloring than by the lack of these.

Chocolate is best purchased by the pound instead of by the cake. Often two cakes, or a pound, sell for less than two cakes bought separately. Bitter, or Baker's, chocolate is used more than sweet chocolate for French candies.

Nuts should be strictly fresh and clean. Use the whole meats on top and the broken pieces in centers and for nut roll.

QUESTIONS AND PROBLEMS

1. Why is a porcelain kettle best for candy making?
2. Why should fondant be stirred until the sugar is dissolved?
3. Why not afterwards?
4. What is the test for determining whether fondant is cooked sufficiently?
5. What is the cream of tartar used for?
6. What is cream of tartar, an acid or an alkaline substance?
7. How can we keep candy from sugaring?
8. What do these candies cost a pound?
9. How could you estimate the cost?
10. What would be a fair profit, if you made these candies to sell?
11. How does your sale price compare with the price of the same quality and kind of candy in the stores?
12. How is candy digested?
13. What difference could the weather have in making fondant?

APPLICATION

1. Fondant (Standard Rule)

6 c. sugar $2\frac{1}{2}$ c. hot water

$\frac{1}{4}$ tsp. cream of tartar

Method.—Add the cream of tartar to the sugar. Put in the kettle. Add the hot water, and put over a moderate fire, stirring until the sugar is all dissolved. Then boil slowly without stirring until a soft ball forms when tested in cold water. Wipe the sides of the kettle occasionally during the boiling to prevent crystals from forming around the edge. Hold the hand in cold water a minute to thoroughly chill it. When cold, wipe around the edge of the candy lightly and quickly with the finger tips, then thrust the hand back into the cold water. The amateur may be a little timid about this at first, and, if preferred, a little cloth tied on a fork wet in water may be used successfully, but do not have too much water on the cloth, as it delays the boiling.

To test the fondant. The best and quickest way is to hold the fingers in cold water until very cold, and then quickly dip them into the boiling sugar, and back again into the cold water. The sugar mixture clings to the fingers and can be rolled in a soft ball more quickly than by dropping it from a spoon into cold water. Turn out on the cold table top or platter without scraping the kettle.

A complete change or a breaking down of the cane sugar into more simple, finer forms of sugar (*fructose* and *glucose*) is necessary to make a smooth, soft fondant. Stirring the sirup while boiling or stirring before it is nearly cold causes little sugar crystals to form, and the fondant becomes granular instead of smooth. Let the fondant stand to cool until the touch of the finger leaves a dent. Then work back and forth with the wooden paddle working around each side, then through the center, and keep the mixture well together so it will all be of the same consistency. When creamy and thick enough to handle with the hands, knead it like dough until it is smooth throughout. Put it into an earthen bowl and cover with paraffin paper. Let stand twenty-four hours in a cool place before working it into bonbons. Do not put fondant in the ice box. A bright sunny day is better for making fondant than a rainy day. Flavor and tint as desired when using for bonbons.

(*Basis for each girl, working alone,* 1 *c. sugar.*)

VARIATIONS OF FONDANT RULE

Maple Fondant

Method.—Use maple sugar in place of cane sugar, and make the same as fondant.

Maple Creams

Method.—Roll maple fondant in inch balls. Press a whole walnut meat on the top and bottom of each cream.

Mints

Method.—Melt portion of the fondant in the upper part of a double boiler over hot water. Flavor with peppermint, wintergreen, cloves, cinnamon, oranges, lemon, or chocolate, as desired. Drop from the tip of a teaspoon on oiled paper. If the mixture gets too thick to drop nicely, add a very little hot water.

Stuffed Dates

Method.—Remove the stones from dates. Roll pieces of fondant which has been flavored with vanilla and insert in the dates. Roll the dates in granulated sugar. Vanilla is the better flavor with dates.

Nut Roll

Method.—Flavor the fondant to be used with vanilla. Chop nut meats (walnuts, almonds, or peanuts) fine. Work into the fondant

evenly. Make a roll an inch and a half in diameter. Slice off into pieces one fourth inch thick.

Chocolate Nut Roll

Method.—Coat nut roll with melted chocolate before slicing, and slice in one fourth inch slices, when the coating is firm.

Chocolate Creams

Method.—Add flavoring to the portion of fondant to be used for cream centers. Break off pieces of even size and roll into uniform balls (about an inch and a quarter in diameter). Drop on wax paper and let. stand an hour or more. Melt Baker's chocolate in a double boiler or bowl over hot water. To the melted chocolate add 1 tsp. melted paraffin to each four squares of chocolate. Dip the cream centers quickly into the melted chocolate and drop on oil paper to harden, Professionals use the hand for dipping chocolates, but a fork may be used by beginners. To keep the chocolate the right consistency for dipping, return it to the hot water bath when it becomes too thick.

Fancy Chocolates

Method.—Nut centers with cream or any center desired may be dipped in chocolate in the same way as plain creams.

2. Opera Creams

6 c. sugar	¼ tsp. cream of tartar
3. c cream	1 tsp. vanilla

Method.—Combine sugar, cream of tartar, and cream, and continue exactly as for making fondant. When kneaded smooth and the mass holds its shape, add the vanilla. Roll out to 1 inch thickness, mark off into one-inch squares, and wrap each square lightly in paraffin paper by twisting the ends on two opposite sides.

3. Fudge Chocolates

Method.—Roll soft, smooth fudge into balls from an inch and a half to one and three fourths inches in diameter. Let stand three or four hours before dipping. Dip in melted chocolate, the same way as in cream centers.

HOME PROJECTS

1. Make fondant and work up into different kinds of candies.
2. Pack attractive boxes of candy and use as Christmas gifts.
3. Visit a candy factory, if possible.

LESSON 28

MAIN DISH FOR LUNCHEON—

Left-Overs—Macaroni—Au Gratin—Soufflés

No matter how accurate the planning may be, there are oftentimes portions of food left over from a meal. The wise planner will look ahead in ordering the supplies or in cooking the dinner one day to prepare enough food in one cooking process to have left-overs to use as a basis for the lunch next day.

It is not wasteful to cook too much for one meal, but it is wasteful if any of the left-over usable portions of food are thrown away.

The **main dish** for luncheon has many possibilities and may be served in many different forms. Too frequently it consists of left-overs from the dinner the day before simply warmed over without any additions or change in appearance or in the form of hash. To the average family these left-overs are most tiresome and very unattractive dishes and, no matter how good they were at their first appearance, they seem to taste different and fail to interest the persons served.

Left-overs.—To utilize the left-over vegetables, fish, meat, and cereals cleverly and appetizingly in the hot dish for luncheon requires only a very little extra work and ingenuity, but the added zest and interest it gives to the meal for each member of the family is well worth the extra few minutes' work.

It is not always wise to use the left-overs from dinner for the luncheon the next day. It is better to wait two days, if possible, and so avoid a repetition of foods and having the the family know exactly what is to be served for luncheon every day.

Meat is served by many families at both the noon and evening meal. To serve meat only once and that at the

heaviest meal of the day is sufficient for most persons. Food authorities agree that as a race the American people eat too much meat.

If there is only a small amount of meat left over from dinner, it may be used in combination with some other food to form the hot dish for luncheon. If considerable is left over, it should be used in some way to form the meat dish for another dinner. When the meat is used for luncheon, the dinner that day should be a meatless meal. One of the meat substitutes or some of the other protein foods may be used in place of meat in the dinner plan.

Some of the protein foods used alone lack flavor and are best combined with some other food rich in flavor. Milk and eggs lack flavor and are better combined with left-over vegetables, cheese, pimientos, fish, or poultry with a good blending of seasonings.

Macaroni or spaghetti when combined with a white sauce and some flavor foods or left-overs make very good wholesome hot dishes for luncheon and may be also used as the substitute dish in the meatless dinner.

When macaroni and cheese in combination are served at a meal, both meat and bread might be omitted, since the proteins and carbohydrates are both contained in the dish of macaroni, but some vegetable would have to be added.

Macaroni, spaghetti, vermicelli, and Italian pastes are made from a hard-wheat flour that contains a large amount of gluten. The Italians place macaroni in the same position in their diet as we Americans do our bread.

Manufacture of Macaroni.—The flour is mixed with hot water to form a stiff paste. This is placed in a steam-heated iron cylinder, the bottom of which is filled with holes. The paste is forced through these holes by a press, and comes out in the form of rods or threads, according to the shape of the opening. These rods are then cut into lengths suitable to handle and are hung up to dry for four

or five days. In Italy, macaroni is hung in the open air on racks and is not as clean as that manufactured in our own country, where it is dried on racks in large, clean drying rooms for the purpose.

Spaghetti is in the form of rods and is solid and smaller.

Vermicelli is solid, thread-like and smaller still than spaghetti.

Appearance.—Good macaroni is rough, yellowish in color, and breaks clean without splitting. When cooked, it swells and is elastic and firm.

Food Value.—Macaroni is rich in gluten and starch, and is both a tissue-building and an energy-giving food. Combined with protein foods, like milk, eggs, or cheese, it is inexpensive and makes a good substitute for meat.

Au Gratin Dishes.—Most any of the left-overs of vegetables, fish, poultry or rice may be prepared au gratin.

Au gratin dishes are those that are baked in the oven with a layer of buttered crumbs on the top. Grated cheese is sometimes used in a layer under the crumbs, if more flavor is desired.

When the ingredients have been previously cooked, it requires only 12-15 minutes to heat the mixture through and brown the top. One comfort in the au gratin dish for the busy housewife is that it may be prepared any time in the morning and be set aside until time for baking. If the food used in the dish requires longer time for baking than 12-15 minutes, the crumbs should be omitted until the last few minutes of cooking to prevent them from burning.

The glass baking dishes afford the easiest and simplest way of baking and serving a hot dish for the family luncheon.

To Prepare Crumbs.—Dry left-over portions of crackers and bread in the warming oven, but do not brown. Roll with the rolling-pin on a board until fine; then sift them and use them either plain or buttered.

To *butter crumbs*, use 2 tablespoonfuls of butter to 1 cupful of crumbs. Put the butter in a pan, melt, and add the crumbs. Stir until all the crumbs are well buttered. Do not brown. Season with salt.

To Grate Cheese.—Use a dry cheese that will grate, but do not pack in measuring it. Grate on a common grater.

Soufflés.—Soufflés make good hot dishes for luncheons and combine eggs and milk with vegetables, cheese or meat in an attractive manner. The air in the egg makes the mixture very light. Only finely minced meat, fish, cheese, and vegetables are suitable to use in a soufflé. Heavy ingredients make the dish heavy and it will not rise. Soufflés should be baked in a moderate oven.

Luncheon Main Dishes Rich in Vitamines.—These are:—

Cream of vegetable soups, as spinach, tomato, cabbage, asparagus.

Salads of fresh fruit, fresh vegetables, fruited gelatins, stuffed prunes, jellied tomato.

Soufflés—spinach, tomato, cauliflower, and carrot.

Vegetables served in cream sauce, as asparagus, new onions, lima beans, celery.

QUESTIONS AND PROBLEMS

1. What is the basis of soufflés?
2. What kind of white sauce is used with macaroni?
3. What kind of white sauce would you use in a vegetable soufflé?
4. What is the oven temperature best for soufflés?
5. Would macaroni and cheese be a suitable dish for a child six years of age?
6. Would it be suitable for the lunch of a girl or boy in seventh grade?
7. Would macaroni and tomatoes be any different in food value and in digestion?
8. In what class of foods would you put the luncheon hot dish?
9. What is the difference in the ease of preparation of a soufflé or an au gratin dish?

APPLICATION

1. Boiled Macaroni

Method.—Break the macaroni into inch pieces. Drop into boiling salted water, allowing 1 tbsp. of salt to 1 qt. of water. Cook until tender, 20 to 25 minutes, or until it can be easily pierced with a fork. Keep plenty of water on to cover while cooking. When tender, pour into a colander and wash thoroughly in cold water to remove the starch that causes the pieces to stick together. Season, and serve with thin White Sauce or with Tomato Sauce.

2. Baked Macaroni with Cheese

1½ c. macaroni	1 c. thin white sauce
½ c. grated cheese	1½ c. buttered crumbs

Method.—Prepare the macaroni as for boiled macaroni. Butter a baking dish, put in a layer of boiled macaroni; then cover with one half of the white sauce, half of the grated cheese and one half the buttered crumbs. Then add the remainder of the macaroni, sauce, cheese, and crumbs. Bake in a moderate oven until the crumbs are nicely browned and the sauce boils up around the sides.

(*Each two use 4 sticks macaroni, 2 tsp. cheese, and ½ c. white sauce.*)

3. Soufflés (Standard Rule)

2 c. thick white sauce	3 eggs
	½ tsp. salt

Method.—Beat the yolks and whites of the eggs separately. Add the yolks and the seasoning to the thick white sauce. When cool, carefully fold in the stiffly beaten whites. Turn the mixture into a well-oiled baking pan. Set the dish in a pan of hot water and bake in a moderate oven until it puffs and becomes firm to the touch, about 30–40 minutes. Serve at once.

(*Basis for 2 girls, ⅓ rule.*)

VARIATIONS OF STANDARD RULE

Cheese Soufflé. Add ½ to 1 c. grated cheese to the hot white sauce.

Vegetable Soufflé. Drain cooked vegetables and mince. Add ½ to 1 c. of vegetables to the hot white sauce.

Fish Soufflé. Add 1 c. finely-minced salmon or cooked fish to the white sauce.

Sweet Soufflé. Add ¼ c. of maple sirup or honey to the hot white sauce. This is used for dessert.

Prune Soufflé. Add ½ to 1 c. sweetened prune pulp to the white sauce. Apples or peaches cooked and put through a strainer may also be used in the same manner and make simple desserts.

4. Au Gratin Dishes (Standard Rule)

1 c. medium white sauce 1½ c. vegetables

To each cup of crumbs use 2 tbsp. melted fat.

If cheese is added, use ¼ c. grated cheese for the top.

Method.—Put a layer of diced vegetables, flaked fish, or cut food in a well-oiled baking dish, add one half of the white sauce then a second layer of vegetable and the remainder of the sauce. Top with a layer of the crumbs and the butter. If cheese is used, add it just before adding the crumbs. If two foodstuffs are combined, alternate layers of each. Starchy materials require a thin white sauce instead of medium white sauce.

Rice or macaroni may be combined with almost any food. Mashed potatoes may take the place of the crumbs occasionally for a change. Add bits of butter on top of potatoes and brown.

Suggested Combinations for Au Gratin Dishes

Food	*Any of these additions*	*Sauce*	*Crumbs*
Cabbage	Cheese	Medium White Sauce	Crumbs.
Cauliflower	Chopped pimientos, parsley	Medium White Sauce	Crumbs.
Asparagus	Ripe olives	Medium White Sauce	Crumbs.
Onions	———	Medium White Sauce	Crumbs.
Potatoes (diced)	Cheese, pimientos	Medium White Sauce	Crumbs.
Sweet potatoes	Cheese	Medium White Sauce	Crumbs.
Rice	Tomatoes, salmon, cheese, eggs	Medium White Sauce	Crumbs.
Macaroni	Cheese, tomatoes, fish, pimientos, dried beef	Medium White Sauce	Crumbs.
Spaghetti	Green peppers, tomatoes, cheese	Medium White Sauce	Crumbs.
Eggs	Cheese, rice	Medium White Sauce	Crumbs.
Fish	Minced parsley	Medium White Sauce	Crumbs.
Apples	Cinnamon—sugar	———	Crumbs.
Corn	Cheese, pimientos	———	Crumbs.
Tomatoes	Crumbs	———	Crumbs.
Oysters	Paprika	———	Crumbs.

Note:—Tomatoes, oysters, corn, or apples, where there is enough liquid, omit the white sauce and alternate layers of crumbs with the material.

HOME PROJECTS

1. Prepare macaroni au gratin with any combination for either luncheon or a dinner once during the week.
2. Prepare a soufflé for one meal.
3. Make out a list of recipes given under the application of lessons so far which would make suitable luncheon dishes.
4. Then, using one of these for the main dish, add two foods which you could serve at the same meal to make a nice luncheon.
5. Write three luncheon menus in this way from your list of recipes.
6. Bring these to class for criticisms and class discussion.

LESSON 29

MENU BUILDING—LUNCHEON MENUS

To plan a daily menu which will provide the kind and amount of food required by each member of the family is the most important part of the housewife's duties, and requires much time, thought, and a knowledge of foods. To plan for the day's meals as a unit or even a week at a time is much better than to plan for each separate meal. The menu builder must have a general idea of the classes of food and the specific functions of food in the body, together with a knowledge of the food and energy requirements of each member of her family.

All five of the food classes should be represented in the diet in at least two meals each day and, if there is not the proper balance of food in a day's menu, it should be righted the second day.

Menus should contain, besides the proper balance of the food classes, foods supplying the mineral substances, iron, phosphate, and calcium, which play important roles in the body, together with those which furnish bulk, as coarse breads and cellulose of green vegetables.

Factors Governing Meal Plans.—The first things to determine are the types of menus which fit the requirements of the family. Age and occupation are the chief factors, although season, nationality, and condition of health also must have consideration.

Age.—If several children of varying ages need to be provided for, milk and eggs and leafy vegetables must have a generous place in their diet, on account of the mineral, protein, and vitamines which are present in very desirable form and quantity for growth. Old persons require much of the same food materials as children.

Food habits of children are easily formed and right habits

are just as easy to establish as wrong ones, if the menu builder will plan wisely and never let exceptions occur. Where poor health and disease require special diets, these must be planned separately in severe cases. In mild cases, simply providing some foods in the menu which are easy of digestion and especially suited to the needs of the patient in the case of adults would be all that would be necessary and the patient may omit such foods as would be harmful.

Adults leading an active life must have more hearty foods and meals than those of sedentary occupation and a man more than a woman.

Occupation.—It would be impossible to plan set diets for every one of the same age and occupation, since nationality and food habits of the family must be considered. A very pleasing food combination or dish for one family may not please another one in the same block.

Climate and season require a change in food plans. In cold weather more energy-giving foods and those which necessitate greater digestive activity may be used. Such foods as pork, baked beans, rich pastry, sausage, hot breads, and plum puddings may be served to adults in cold climates and during the winter months with no apparent difficulty in digestion or ill results, while it would be almost criminal to serve them during hot weather. Foods easy of digestion, as fresh fruit and green crisp vegetables, that serve to cool the body, lean meat, and meat substitutes should prevail during the hot summer days.

Too frequent and rapid drinking of ice-cold beverages, as well as eating ices and all frozen dishes rapidly, is harmful, since they chill the digestive organs and retard their normal and necessary action. These beverages are very seasonable and proper if used with discretion.

Digestion must always be considered as a part of any meal plan. Foods of varying nature, such as liquid and solid, easy or difficult of digestion, should make up the menu, in

order to gain the best results, and not place too much work upon any of the digestive organs.

It is a poorly planned menu which offers two foods difficult of digestion in one day. One is a sufficient tax on the digestive organs. Such foods may be distributed along in a week's plan and not be harmful. These foods comprise the fatty foods, fried foods and concentrated food, such as cheese.

The flavor, color, texture, variety and manner of serving a food have much to do with the interest and appetite.

Flavor.—Never serve a meal lacking in flavoring, no matter how well balanced it may be, but avoid serving two dishes of the same flavor at the same meal, as pea soup, creamed peas, or tomato salad and tomato soup. Courses should contrast in flavor, a mild course being followed by one more pronounced. Strong seasonings which destroy natural food flavors are harmful.

Never serve two foods of pronounced flavor in the same meal. A meal containing three foods as salmon, tomatoes, and prunes, is an unpardonable error. If one prounounced flavor food is used, there should be other foods which are mild in flavor.

Bread, butter, and milk may be served in the same form each day. The bread may be changed easily, but no other food should be served in the same form twice the same day.

Color.—Several foods which do not harmonize in color may easily spoil the whole appearance of the meal, such as carrots, and tomatoes, or salmon and tomatoes.

Only natural colorings, such as green pepper, parsley, tomatoes, pimientos, grated egg yolks, and orange rind should be used to form a color scheme. The artificial colors are seldom necessary.

The texture of dishes should vary, that is, do not serve two creamed dishes in one course. Courses should vary in texture also. A liquid course like soup should be followed by a solid food. Many combinations of food are quite

generally used, which bring out a pleasing contrast in flavor and texture. Chief among those commonly used are crackers with soup, cranberry sauce with fowl, wafers with cheese, apple sauce with pork.

Variety is very desirable in meals, but too much at one time makes it more difficult to plan for the future. Dishes which are especial favorites with the family may be repeated more often than others, but they should not be served too often; for few dishes will withstand such a test. Never repeat a week's menus, or have regular days for a dish. It is much more interesting for the family to wonder "what we shall have for dinner," than to know "this is the day for pork or meat substitute." An entirely new dish or combination of dishes occasionally is welcome.

Where seasons are short of fruit and vegetables, it is necessary to make frequent use of them in the diet. Variety may be obtained by preparing them in different ways. Use of seasonable food is a great aid in reducing the cost of meals. Dried fruits are high in food values and also aid in reducing cost. Many attractive methods of serving them should be used instead of always stewing.

The manner of serving a food should always be simple, dainty, attractive, varied. To always serve a food in the same dish becomes monotonous. Keen interest may be maintained in simple common foods with a little change in service. Perfectly fresh linen and dishes are great assets in proper table service.

Rules for Building Menus.—Observance of the following rules is essential for best results in menu building:

1. Serve some food from each class for each meal.

2. Serve whole milk, eggs, and fresh vegetables and fruits every day of the year, if possible. Include in each meal the foods which are needed by each member of the family.

3. Serve easily-digested foods for children and old people. Serve the hearty energy foods for active adults.

4. Simple, well-cooked foods are better than elaborate dishes.

5. Serve a few dishes at one meal and see that no one food class predominates. For example, potatoes and rice are both starchy foods and nearly equivalent. One is sufficient. Macaroni and cheese and meat are protein and should not be served at the same time, nor fried foods with rich whipped cream desserts or oil salads, all of the fatty class.

6. Carbohydrate foods should have both starches and sugar well represented with more starch than sugar.

7. Bread stuffs furnish the carbohydrates for the meal.

8. If the salad is one of green vegetables or fruit, it is better not to have a fruit dessert, but one containing more starch or protein.

9. If meat is used in the hot dish or salad, then the dessert should be a light fruit.

10. The hot dish may be replaced by the salad in luncheon menus only in the menu of the adult. Children should not be given heavy, rich salads.

11. Do not serve all hot or all cold dishes. A cold relish or dessert is desirable with a hot main dish and a hot dessert with a cold salad.

12. Do not season foods so highly that the natural flavor is destroyed.

13. Do not serve too many kinds of food at one meal. There are other meals to follow.

14. Do not attempt the preparation of two new dishes at one meal.

15. Serve foods in season and within reasonable price.

16. Serve hot foods hot.

17. Serve cold foods cold.

18. Never use a food for the main dish which is decidedly out of favor with some members of the family.

19. There is no connection between nutritive value and price of food. One must learn to think of nutritive value

when planning menus. Some of the foods riches in nutrients are low in price, but a low price does not always signify food value. The best way to reduce cost of menus is to substitute foods of equal value but of less cost.

20. Foods which stimualte digestive organs should come first in a meal, as fruit for breakfast and soup for dinner.

21. There should be at least one hot dish in each meal.

22. Arrange preparation of meals to save time and fuel. Use the oven for several things at one time. Never plan a roast without using the oven for the preparation of vegetables, dessert for next day's lunch or supper all at one time.

23. Cold desserts should be made in the early morning before washing the breakfast dishes. Much of the dinner arrangements may be made ready early in the day, vegetables made ready and desserts and soup prepared.

24. Plan ahead for left-overs from one day to provide lunch material the day or two days after.

25. Use a fireless cooker for long slow cooking processes, as for cooking cereals.

Luncheon.—When the man of the family is not able to come home at noon, or, if by chance the heavy meal of the day is served at night, the meal at noon is called luncheon. If the principal meal is served at noon and a lighter meal in the evening, then it is called lunch or supper, and sometimes tea. Habit determines the character of the meal. If one is accustomed to a light luncheon at noon, one will feel distressed when a heavier luncheon is eaten. On the other hand, if a person usually eats a hearty luncheon at noon, he by force of habit thinks he requires that type of lunch. A person doing much physical exercise requires a different type of lunch than a person in an office, schoolroom, or doing normal household work. Growing children are better served with their heaviest meal in the middle of the day.

Luncheon plans depend largely on the breakfast plans. If a very light breakfast is used, a warm substantial lunch

should follow, and vice versa. The luncheon should be the one meal to balance up the food values of the day. If any one food class has been short in the dinner or breakfast, the lunch is the place to remedy the deficit.

The type of meal for luncheon or supper is practically the same, and may be classed as follows:—

Type I	Type II	Type III	Type IV
A hot dish	A hot dish	Soup	Soup or fruit cup
Salad	or a salad	Hot dish or	Hot dish
Bread	Bread	salad	Bread and relish
Beverage	Simple dessert	Bread	Salad
	Beverage	Dessert	Dessert
		Beverage	Beverage

Type I is used for simple luncheon for less active persons. It has one course.

Type II is best for growing children and the average family. It has two courses.

Type III may be used as a simple company luncheon. It has three courses.

Type IV is used for the more formal luncheon. It has three or four courses.

Hot dishes may include cream soups, cream foods served on toast or in timbale shells, au gratin dishes, soufflés, croquettes, hot sandwiches, or eggs served in one of endless ways.

The hot sandwiches, like clubhouse or combination of clubhouse with tomato or grated cheese, cold meat, or egg make an attractive main dish for luncheon, and combine the protein, carbohydrate, and fat foods all in one. Summer luncheons may include any of the lighter cold combinations for sandwiches, or the hot dish may be replaced by a salad in the diet of an adult, when preferred. Many women prefer the salad to a hot dish and, if the weather is hot or their work is light, it fits in admirably well.

The hot dish is best for children and tired workers.

LUNCHEON AIDS IN MENU BUILDING

Soup	Hot Dish	Salad	Bread	Dessert	Beverage	
					Adults	Children
I. Cream, pea, bean. lentil,		Vegetable, tomato, potato, head lettuce.	Rolls, bicuit, peanut sandwiches.	Tea cakes.	Tea, coffee.	Cocoa, milk
II. Cream tomato.		Meat or fish.	Croutons, bread, cheese, sandwiches, pop-overs.	Lemon queens, canned fruit.	Tea, coffee.	Cocoa, milk.
III.	Baked macaroni with fish, or dried beef or cheese.		Hot B. P. cinnamon rolls.	Baked apple, cream.	Tea, coffee.	Cocoa, milk.
IV.	Omelets (jelly, rice, ham) with white sauce, peas.		Rolls.	Fresh berry tarts, or quick puddings.	Tea, coffee.	Cocoa, milk.
V.	Spaghetti, rice, tomatoes, green peppers, baked casserole dishes.	Relish.	Hot biscuit, honey.	Cup custards, floating island, choc. cream pudding.	Tea, coffee.	Cocoa, milk.
VI.		Fish, meat or egg, chicken.	Cheese rolls, olive sandwiches, nut bread.	Apple dumplings, Dutch apple cake, berry pie.	Tea, coffee.	Cocoa, milk.
VII. Cream, celery, onions, potato, rice.	Stuffed baked potatoes, chicken or veal croquettes, creamed chicken on toast.	Jelly.	Rolls.	Short cakes, sherbets, apple tapioca.	Tea, coffee.	Cocoa, milk.
VIII.	French toast, waffles, sirup, rice croquettes, jelly.	Tomato, fruit wafers.		Individual custard pie pumpkin.	Tea, coffee.	Cocoa, milk.
IX.	Baked beans, minced ham creamed chipped beef, salmon soufflé.	Pickles, relish.	Brown bread, toast.	Fresh canned fruit, sherbet, cake.	Tea, coffee.	Cocoa, milk.
X. Fruit, cup, (cold).	Scalloped dishes, oysters, corn, soufflés cheese, pea, eggs a la Suisse.		Potato muffins, berry muffins.	Fresh fruit.	Tea, coffee.	Cocoa, milk.

Salad, may include any of the fruit, fish, meat, and starchy vegetable salads. Green, leafy salads are served alone only in very light luncheons or when accompanied by the hot dish or a heavy dessert.

Breads may include any or all kinds. The whole-grain breads are of a special value in building a luncheon menu.

The beverage may be the only hot dish in summer luncheons, or it may be a cold beverage instead of the cocoa or chocolate. Tea and coffee must be served to adults only. Hot chocolate malted milk makes a hot dish of great value in the luncheon. It may be served iced in the summer time.

Desserts depend upon what has been served before. If the main dish has been a heavy one, the dessert can be a light one of fruit. If the main dish has been a light one, then the dessert may be a heavier one of a steamed or baked mixture.

Menu Tests.—Finished menus should be tested to see whether they meet all the requirements. Simple tests to apply are:—

1. Is it suited to the needs of the growing children?
2. Is it suited to the needs of each member of the family?
3. Is it suited to season and market conditions?
4. Is it within the income and allowance?
5. Is there a good distribution of soft and solid food?
6. Does it contain more than two decidedly flavored or colored foods?
7. Does the week's menu offer variety from day to day?
8. Does it call for simple table service and preparation of dishes?

QUESTIONS AND PROBLEMS

1. Compare the type of luncheons with the breakfast plans.
2. How could the same table service be adapted to both?
3. What are the food classes?
4. What does each do in the body?
5. What are the regulating foods?
6. What are the ash foods?

7. Why do old people require about the same kind of food as children?

8. Why is each of the following foods of value in the diet: Spinach, orange juice, carrots, oatmeal, milk, eggs, cauliflower?

9. What would be wrong with the luncheon plan of salmon, tomatoes, and prunes?

APPLICATION

Plan luncheon menus. Divide the class into groups of four each, representing a family. Each family plan the work and divide the duties of preparing and serving their luncheon.

If luncheon work is continued through the semester and each family group serves several luncheons, rotate the duties to give each member an opportunity of performing each duty, that is, either as host or hostess, and serving as waitress.

Use one simple type, as Type II, of luncheon for the first plans and serving.

Make posters illustrating good combinatons of food for luncheons for children.

MEAL PLANNING

If luncheon plans are to be continued all during the semester, give luncheon lessons following bread lessons and use the lessons with applications in conjunction with meal serving. This semester includes all dishes suitable for luncheons.

HOME PROJECTS

1. Help mother plan the luncheons and breakfasts all next week.
2. Prepare and serve supper on Sunday night.
3. Prepare a hot bread for one dinner.
4. Prepare the fruit for one breakfast.

LESSON 30

TABLE ETIQUETTE—SERVING A LUNCHEON

In the serving of luncheons the compromise service is most commonly used. It combines both the Russian and English styles of serving.

Soup, salad, and dessert may be served Russian style (from the kitchen) and the main dish according to the English style (at the table).

For the simple home meals the salad is best served at the table. If a soup is served from the kitchen before the meal is announced, it must be very hot, or it will cool off too much before the guests are seated. It may be served from the kitchen after the guests are seated or from a tureen at the table.

Desserts are usually best served in the simple meals at table, if the serving is done well and without confusion.

No matter what style of service is chosen for a meal, the underlying principle should be one of simplicity, so well regulated that the social pleasures of the family or guests are not disturbed by it.

The serving of a meal in the home requires a carefully selected menu and well planned service if the hostess is to remain at the table and take part in the conversation.

It is better to omit a course requiring much service and many trips to the kitchen than to have frequent interruptions of this kind and make your guests feel uncomfortable.

The table setting is very simple for the home luncheon. A small cloth or doilies may be used in place of the dinner cloth. For the formal luncheon the setting is more elaborate. If the table has a polished top, small doilies may be used effectively.

The luncheon may be made very attractive by the use of bright, colorful dishes. The English porcelains or semi-

Detail of formal luncheon Type IV. Showing the first course of iced watermelon balls with sprig of mint at each cover.

porcelain dishes with their artistic designs and shapes are especially good for luncheon and breakfast dishes. Avoid using gayly colored china which does not blend with the color of the food served as, for example, pink china and salmon salad.

The hostess serves if the host is absent.

The main dish (either a hot dish or a salad) is placed in front at the top of the cover of the one who serves the plates with the plates in a pile directly in front. If a hot dish and salad are both used, the salad is placed at the right-hand side of the cover within easy reach for serving. If a hot dish and salad are both served at the simple home luncheon, they are both served by the hostess or by the host, if he is present, upon the luncheon plate. If the salad servings are arranged neatly in little nests, as stated in the salad lesson, the appearance is attractive and much better than to use individual salad plates. Hot breads must all be served hot in the fold of a linen square or a napkin.

A large salad or meat serving fork is used with a smaller fork to assist in lifting the salad from the salad bowl or chop plate to the individual plates. A large serving spoon is used to serve the hot dish. Sometimes a fork or a spoon used in the left hand is of assistance in guiding the food held on the spoon in the right hand.

Serve omelets or creamed dishes over toast on an attractive platter or chop plate.

Serve the hot foods on serving platter, one in the center, the other as a border, to economize dishes and lend attractiveness, as omelet with white sauce border, or border of peas; croquettes with tomato sauce.

Desserts are always served at table for informal luncheons or suppers. Desserts and individual dishes for serving may be in readiness on the side table or tea cart when the luncheon is announced, and easily transferred to the luncheon table when the first course is completed. The luncheon

plates may be removed to the kitchen by some member of the family while the hostess serves the dessert. If preferred, they may be passed to the hostess who places them on the side table until after the meal is over. Steps and time are saved in this way, but it is not recommended as a very attractive method. Children can be assigned to remove the plates at luncheon time. This service is excellent training and a great help to mother after the meal.

Beverage.—The service for the hot beverage should be simply arranged in front of the one who pours it. The necessary cups and saucers are arranged at the right of the cover with the handles all turned in the same direction, toward the right hand of the one who serves the beverage.

Serve the hot beverage with the main course. Some member of the family may pour it, if the hostess is busy serving the plates.

Have all dishes, food to be served, with beverage tray service on the table when the meal is announced.

The one who serves the plates should say for whom the plate is served as he starts to pass it. In passing plates along the one at the farthest end of the table receives the first plate, then each in turn on the one side until all are served. Then, beginning on the other side, pass the plates in the same way. If the host serves, then the hostess is the first served, and the ones nearest him the last served, regardless of who the guests are.

Service with a Maid.—All rules for serving are practically the same, the main difference being that the hostess does not leave her place at table during a meal—and the waitress attends to the service of dishes in and out of the dining room and passing dishes to the guests in place of having dishes passed along at table.

The maid remains in the dining room while the guests are seated, and until each course is served completely. Dishes which admit of choice, as rolls, jelly, and olives are

passed by the waitress to the left of each guest in turn. The dish is held low and near the guest. All dishes to be placed on the table, as individual salads, are placed at the left of each guest. Coffee cups are the only exceptions. These are placed at the right.

Dishes are removed from the left, unless doing so necessitates reaching in front of a guest.

The hostess is always served first, the honor guest next.

A folded napkin or small tray is used under all dishes carried by the waitress.

Fruit courses should be on the table, as in service without a maid, when the meal is announced.

In the main course the waitress stands at the left side towards the back of the host when he is serving the plates. As one plate is served the waitress takes it and passes to the left of the hostess and places it over the left shoulder of the guest.

The waitress then returns to the left of the host in time to receive the next plate served.

Bread and rolls are passed by the waitress.

Salads may be served as a separate course from the pantry. If served at table, the waitress places the plates for the hostess at each cover. Desserts may be served at table or from the pantry, but coffee is best served at table.

The maid refills the glasses as needed.

The maid passes the dessert and places it before each guest over the left shoulder in the same manner as the luncheon plate.

One maid should be able to serve eight guests nicely, but can not attend to the wants of more than twelve at one time.

The maid assists in passing the cups of hot beverage. If the hostess serves it at table, the maid stands at her left side and receives each cup as it is poured, and places it at the right-hand side of each guest. The maid should return

to the kitchen or serving pantry as soon as her serving duties are ended, but should respond readily when needed. If no bell is used to summon the maid, it is her duty to be watchful of the wants of the guests and time for removal of one course and the serving of the next.

Table Etiquette.—When invited into the dining room, take your place at the back of the chair indicated by the hostess until she gives the sign to be seated. The gentlemen should assist in placing the chairs for the ladies at their right hand. The chairs, if properly placed, need not be pulled out before sitting down. Always sit down and rise at the left side of your chair.

If uncertain what to do at any time during the meal, observe the hostess and do as she does.

In opening the napkin, do not lift it above the table, simply draw if off carefully and unfold half way and draw across the lap. If a bread stick or roll is folded in the napkin, place it on the service plate, in case there is no bread and butter plate. When the meal is ended, simply lay the napkin up at the side of the plate, after the hostess disposes of hers. If a guest for more than one meal, fold the napkin neatly.

Sit erect at the table without leaning against the table, and keep the arms off the table.

Do not handle or play with the silver during the meal or gesticulate with the knife or fork in speaking.

The silver is placed in order of serving with that to be used first at the outer edge of the cover. Use it in this order.

The knife is used only to cut with and to spread the bread. A small knife is often used for spreading butter.

In cutting, grasp the handles of the knife and fork firmly with the palm of the hands over each handle.

After using the knife place it across the plate at the upper right-hand side out of the way while eating. Never rest the handle on the table. When passing the plate for another

serving or when plates are to be removed, place both knife and fork parallel on the plate at the upper right-hand side.

In spreading bread with butter break off a portion and, holding this in the left hand, butter it. Never place the bread on the tablecloth to butter it. Do not spread a whole slice at one time.

The fork is used to hold food in place while cutting with the knife, to carry food to the mouth, and to cut any soft food which does not require a knife.

Leave the napkin across the lap during the meal. Never draw it up to the neck.

To use the soup spoon, dip it away from you in filling the bowl and take all food from the side of the spoon, never from the tip.

Never put crackers or bread into the soup.

The teaspoon is used to convey soft food to the mouth; to stir sugar into a beverage, and to test the flavor and temperature. After testing, it should be placed at the side on the saucer. Never let it remain in the cup. Also drink a beverage from the cup.

Avoid talking when any food is in the mouth. Keep lips closed while masticating food.

Eat quietly and chew all food thoroughly.

Do not raise food on the fork or spoon while talking.

Never scrape dishes or tip soup or dessert dishes to remove the last of the food.

Celery, wafers, olives, radishes and salted nuts are eaten from the fingers.

In eating green corn from the cob, break the cob into short lengths and convey to the mouth with one hand only.

In passing dishes take care not to let the fingers get over the edge of the dish. Use the handles when passing creamer and sugar bowl.

Be careful about taking too hot food in the mouth. Wait until it cools.

If you do not care for any food served, simply leave it on the plate untouched without any comment to draw attention to it.

Drink slowly and raise the glass with the right hand.

A second helping of food may be taken at a meal at home if the host offers it, but at the formal or company meal the second helping is not offered.

In offering to serve any one or pass anything simply say, "May I help you?" or "Let me give you."

To use the finger bowl, dip the tips of the fingers of first one hand then the other lightly in the water and dry them on the napkin.

The personal appearance of hair, hands and dress must always be neat and clean before appearing at table. A man should never appear at table in his shirt sleeves.

True politeness should be the real guide for table etiquette and an unselfish thought for others means good manners at all times.

The uniform of a waitress includes a neat, simple wash dress, either black or white, and a plain white apron. A small cap may or may not be worn. A waitress must be neat, quick, careful, quiet, clean, and observing in her work.

The duties of a waitress include the care of the dining room and room from which the food is served, also the care of the silver, cut glass, fine china, and linens. She must prepare the salads, butter balls, beverages, and cut the bread. She must keep hot things hot and cold things cold.

QUESTIONS AND PROBLEMS

1. What are some of the important points in personal appearance for a maid? Name three.
2. Would those same points be necessary for the children being served?
3. What would the luncheon cover for Type II include?
4. Would Type IV luncheon require any change of cover from Type II?
5. Why should children be taught table etiquette very early?

6. How is the soup spoon used?
7. Why should you chew all food thoroughly?

APPLICATION

Demonstration of setting luncheon table.
Demonstration of good and bad table etiquette.
Change luncheon menus to conform to test.

MEAL PLANNING

Test finished menus submitted by groups to see whether they meet all requirements. Serve simple home luncheon Type II by groups.

ASSIGNMENT

Assign topic of china and English porcelains to two girls. Have them get samples and illustrations and report on their topic to the class next lesson.

HOME PROJECTS

1. Plan luncheons for the family for one week.
2. Prepare the luncheon on Saturday.
3. Cook at least two dishes for some other meal during the week.

LESSON 31

LUNCHEONS

Hot Desserts—Sauces

Rich desserts are too heavy to use with a hearty dinner and should be used only to form a part of the meal or for luncheon. For the most part, fruit is best for dessert with a dinner.

Methods of Cooking.—Hot desserts are either steamed or baked. Steaming is done in a steamer over boiling water (moist steaming) or in a double boiler (dry steaming). Moist steaming is required for heavy puddings, and for those that contain citron or fruit. Dry steaming is necessary for custard, and insures a more even cooking. Steaming is a slow process and requires several hours.

The preparation of materials used to add flavor to hot desserts should be completed before any combining of ingredients is begun, since most of them require special attention as follows:—

Suet.—Break into small pieces, remove the membranes, and chop on a board. Dredge with flour to prevent suet from being sticky.

Raisins.—Look over and pick out any imperfect ones and stems. Wash in a strainer set in a bowl of water. Drain, and cut into small pieces. Always dredge with flour before adding to a batter to prevent the raisins from sticking together. If raisins are not seeded when purchased, pour boiling water over a few at a time, drain, and press out seeds clean before cutting up the raisins.

Currants.—Wash currants thoroughly in a strainer in a bowl of warm water. Rub them well and change the water several times until it remains clean and all the grit and fine stems are removed. Drain, and dry between towels. Dredge with flour.

Citron.—Cut up citron into small pieces; dredge slightly with flour before adding to a mixture.

Dates.—Wash well, stone, and cut with scissors into small uniform pieces.

Nuts.—Sort, wash, and cut in small pieces.

QUESTIONS AND PROBLEMS

1. What food class is represented by each of the following desserts? Bread pudding? Date pudding? Suet pudding?
2. What kind of a hot dish would you serve for luncheon with the following desserts: Bread pudding? Apple sauce? Baked custard?
3. Write a simple luncheon menu to go with each of these desserts.
4. What would be the comparative cost of these menus?
5. Could you substitute any other food which would lessen the cost and give the same food value?
6. Where could you use Chocolate Sauce?
7. What kind of dessert is Hard Sauce used with? Does this make a heavy or a light dessert?
8. If you were called upon to get a luncheon in a home in one hour's time for four persons from the following supplies on hand, how could you use them to make a good attractive luncheon?

Supplies:—

1½ c. cooked rice
1 large can tomatoes
1 can peaches

Bread, butter, milk, eggs, flour cocoa and plain cheese are also available.

APPLICATION

1. Suet Pudding

1 c. suet cut fine	1½ tsp. salt
1 c. molasses	½ tsp. ginger
1 c. milk	½ tsp. cloves
3 c. flour	½ tsp. nutmeg
1 tsp. soda	1 tsp. cinnamon
½ c. raisins	½ c. currants

Method.—Mix and sift the dry materials, add the raisins and currants cut fine and floured. Add the molasses and milk to the suet. Add wet mixture to dry. Pour in buttered mold, cover, and steam 3 hours. Serve hot with a pudding sauce.

(*Basis for 2 girls, ⅙ rule.*)

2. Bread Pudding

2 c. stale bread crumbs	2 eggs
1 qt. scalded milk	½ tsp. salt
½ c. sugar.	1 tsp. vanilla or
¼ c. melted butter	¼ tsp. spice
½ c. raisins	1¼ c. currants

Method.—Soak bread crumbs in milk, let cool, add the sugar, butter, eggs slightly beaten, salt, flavoring, raisins, and currants. Bake 1 hour in a buttered dish in a slow oven as for custards.

(*Basis for 2 girls, ⅛ rule.*)

VARIATIONS OF BREAD PUDDING RULE

Queen's Pudding

Method.—Spread plain Bread Pudding with currant or plum jelly and then add a meringue, as for Lemon Pie. Set in oven to brown.

Chocolate Bread Pudding

Add 1½ sq. Baker's chocolate or 6 tbsp. cocoa.

Omit spice, raisins, and currants.

Method.—Melt chocolate and add to the softened bread crumbs.

3. Date Pudding

2 eggs	1 tsp. baking powder
½ c. sugar	1 lb. dates
3 hp. tsp. flour	1 c. walnuts

1 c. whipped cream

Method.—Beat eggs separately until very light; add sugar to the beaten yolks; cut the dates and walnuts up fine, flour thoroughly, and add to the egg mixture. Fold in lightly the remainder of the flour, the stiffly beaten whites of the eggs, and the baking powder. Bake in a moderate oven ½ hour, and as soon as taken from the oven pour over it the whipped cream. Serve while hot.

4. Plain Steamed Pudding

1 c. molasses	1 egg
1 c. warm water	2½ c. flour
1 c. chopped raisins	1 tsp. soda

Method.—Sift the soda with the flour, clean and chop the raisins, and add the flour. Beat the egg, add the warm water and molasses. Combine wet mixture with dry. Put in buttered molds and steam 2½ hours. This is less expensive than suet pudding.

5. Plain Pudding Sauce. (Standard Rule)

½ c. sugar	2 tbsp. butter
1 c. boiling water	Pinch salt
1 tbsp. cornstarch or flour	Flavoring

Method.—Mix sugar and cornstarch in a sauce pan. Pour on the boiling water, stirring rapidly. Boil and stir until clear, add butter and flavoring. Serve hot or cold.

Variations in flavoring:—

Lemon Sauce. Use 1½ tbsp. lemon juice.

Vanilla Sauce. Use 1 tsp vanilla.

Caramel Sauce. Use brown sugar in place of white.

6. Hard Sauce

¼ c. butter
1 c. powdered sugar
⅔ tsp. vanilla
½ tsp. lemon extract

Method.—Cream the butter, add the sugar gradually, add the vanilla, and work to keep sauce smooth. Beat until creamy. Set in ice box to harden. Serve cold.

7. Chocolate Sauce

1½ c. water
⅓ c. sugar
2 sq. chocolate
1 tbsp. cornstarch
½ c. cold water
Pinch of salt
½ tsp. vanilla

Method.—Boil sugar and water 4 to 5 minutes to make a sirup. Mix chocolate, starch, and ½ c. cold water; add the salt, then the hot sirup, and cook 3 minutes. Flavor, and serve hot.

MEAL PLANNING

Serve a luncheon Type II, using a hot dessert.

HOME PROJECTS

1. Prepare one of the hot desserts given under this lesson during the week.
2. Prepare luncheon menus for the children during the week.
3. Adapt these to the grown persons also.

LESSON 32

LUNCHEONS

Cold Desserts

Cold desserts are suitable for use with any type of luncheon or dinner menu. They must be prepared several hours before serving time and will then have advantages as labor-savers over the hot desserts which require last-minute attention at a time when other food preparation is in progress.

The service of any cold dessert may be made very attractive by the use of pretty dishes, and a little fruit garnish.

QUESTIONS AND PROBLEMS

1. What is the food value of Prune Whip?
2. How does it compare with Floating Island?
3. What class of foods does Tapioca Cream represent?
4. How could you change the pineapple tapioca recipe to use other fruits?
5. What would you need to add if you used fresh strawberries?
6. Write simple luncheon menus Type I, using each of these desserts.
7. What would be the cost of a dessert of Prune Whip?
8. What would be the cost of a dessert of Floating Island?

APPLICATION

1. Prune Whip

2 c. prunes	½ c. sugar
2 egg whites	1 tsp. lemon juice

Method.—Pick over and wash the prunes well, and let soak several hours in cold water to cover them. Cook in the same water until soft, remove the stones and rub the prunes through a strainer. Add the sugar, and cook 5 minutes to the consistency of marmalade. Beat the whites until stiff, add the prune mixture when cold, together with the lemon juice. Pile highly in a buttered pudding dish and bake in a slow oven about 15 to 20 minutes. Serve cold with a boiled custard.

(*Basis for 2 girls, ½ rule.*)

2. Pineapple Whip

Use grated pineapple in place of prunes and make the same as Prune Whip.

3. Floating Island

1½ c. scalding milk	½ tsp. salt
3 eggs (yolks)	3 egg whites
¼ c. sugar	½ tsp. vanilla

Method.—Scald the milk. Separate the eggs. Beat the whites until stiff and dry. Fold in 2 tbsp. sugar, and carefully cook whites in the hot milk 2 or 3 minutes. Remove them with a large spoon to a serving dish. Make a custard of the other ingredients, the same as boiled custard. Cook until it coats the spoon. Remove at once, add the flavoring, and pour around the cooked whites. Serve cold.

(*Rule for 2 girls, ½ rule.*)

4. Chocolate Cream Pudding

2 c. scalded milk	⅓ c. cold milk
5 tbsp. cornstarch	1½ sq. Baker's chocolate
½ c. sugar	3 tbsp. hot water
¼ tsp. salt	Whites of 3 eggs
1 tsp. vanilla	

Method.—Mix the cornstarch, sugar, and salt, add the cold milk, stir thoroughly, and then add to the scalded milk. Cook in a double boiler 8 to 10 minutes, stirring constantly until custard thickens. Melt the chocolate in the hot water, stir until smooth, and then add to the mixture. Add the stiffly beaten whites and vanilla. Mold, chill, and serve.

(*Basis for 2 girls, ⅓ rule.*)

5. Tapioca Cream

1½ tbsp. minute tapioca	1 egg
1½ tbsp. sugar	1 c. milk
⅛ tsp. salt	1 tsp. vanilla

Method.—Scald milk in double boiler. Mix tapioca, sugar, and salt. Add slowly the scalded milk. Return to the double boiler and cook 15 minutes. Add beaten egg yolk, then fold in carefully the stiffly beaten white. Add the flavoring and chill. Serve plain or with any fresh fruit in season.

6. Pineapple Tapioca

⅜ c. minute tapioca	2¼ c. boiling water
⅜ c. sugar	1½ c. grated pineapple
½ tsp. salt	

Method.—Mix tapioca, sugar, and salt. Pour the boiling water over slowly, then cook in a double boiler until clear, about 15 minutes. Put the grated pineapple in a glass dish, pour over the slightly-cooled

tapioca mixture, and chill. Decorate the top with currant jelly just before serving.

MEAL PLANNING

Continue with luncheons for class work using cold desserts. Use Type III or IV and make it a luncheon for invited guests, and assign waitresses and a host and a hostess.

Girls work out the cost of their luncheons served.

HOME PROJECTS

1. Make two cold desserts from this lesson during next week.
2. Make a list of all dessert recipes given in the other lessons in the text so far. Classify these as to hot or cold desserts and make an index of these in your textbook in the cold and hot dessert lessons.

LESSON 33

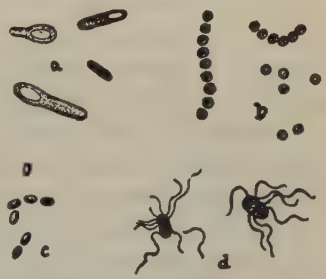
PART TWO

PRESERVATION OF FOOD

Fruits

Preservation as applied to food is the process of preventing decomposition, which is caused by the presence of minute living organisms which attack it.

Bacteria, yeast, and molds are vegetable micro-organisms, which, with warmth, moisture, and oxygen, multiply rapidly by feeding on other organic substances. Each has its own preference for food. Bacteria do not like sugar, and very few care for acid. They like the protein foods of milk, eggs, and meat best. These organisms are the hardest to kill. Yeasts prefer some sugar, and are not affected by weak acids. Yeast organisms are responsible for the spoiling of fruits and fruit juices, but are very easily killed. Molds grow on bread, fruit, and jelly, and are easily killed when in the spore state.



Bacteria (greatly enlarged): *a*, rod-shaped, showing spores; *b*, spherical; *c*, typical lactic-acid bacteria; *d*, bacteria with hairlike appendages, with which they swim about in water or milk.

The housewife is more familiar with yeasts and molds than with bacteria. She should know, however, that bacteria are both friends and foes. As friends they account for the pleasing flavor of butter, cheese, and vinegar. As foes they cause the decay and loss of many foods and are frequent carriers of disease. We try to combat their detrimental effects by protecting, or preserving, our foods from their attack and by killing them by heat or chemicals. For the sake, therefore, of our food and health we are vitally

interested in studying the nature of these various tiny plants, so numerous about us and capable of injury or service.

REASONS AND MEANS

Advantages of Preserving Food.—People never lived so well as the average live to-day. One great reason is the abundance and variety of food, made possible largely by methods of preservation. Advantages of food preservation are:—

1. To insure clean, wholesome food, free from bacteria.
2. To enable us to have food out of season.
3. To afford us economy by making it possible to purchase food when it is best and cheapest rather than when it is scarce, expensive, and inferior in quality.
4. To permit transportation from one part of the country to another or from one country to another. Thus we have the use of foods grown all over the world.

Methods of Preserving Food.—Food is preserved by producing conditions unfavorable to the growth of bacteria in it and which destroy their effects. This is accomplished

1. By applying a low temperature.
2. By applying a high temperature.
3. By drying (dehydration).
4. By excluding air.
5. By adding preservatives.

Refrigeration is preservation by holding food at a low temperature. Freezing and cold storage are means of keeping food for long periods; cellars and ice boxes, for short periods.

Freezing or packing in dry snow or ice checks the growth of bacteria as long as the food is in a frozen condition. Food deteriorates quickly after thawing out, and should be used immediately. Meat and fish are most commonly frozen.

Cold storage, or keeping food in cold, dry storerooms artificially cooled to just above the freezing point, preserves food. Cellars and ice boxes act similarly for homes.

Sterilization is a process of destroying bacteria by excessive heat. The growing bacteria may be killed by boiling at a temperature of 140°-160° F. The spores, or dormant forms, must be boiled for a few hours.

Canning, or sealing sterilized food in air-tight sterilized jars, is a common household method of food preservation. Boiling for 20 minutes will generally kill most forms of bacteria. Fruits, vegetables, and meats are preserved by canning.

Drying.—Bacteria require considerable moisture in a material in order to grow in it. Drying a food, therefore, preserves it from decay. Flour, crackers, cereals, and many other foods do not spoil, because they are dry. So also dried fruits are immune to bacteria. Dried foods must be kept in a dry place so as to prevent the absorption of sufficient moisture to give the germs of decay on or in them a chance to grow.

The excluding of air also aids in preserving some food products. Eggs may be coated with paraffin or vaseline or put in water glass; likewise grapes are packed in cork.

Preservatives.—Antiseptics are materials that do not kill bacteria but which retard or prevent their growth. Those used to preserve food should be harmless to the body. Common examples of these are:—sugar, salt, acids, and spices.

Sugar.—Bacteria can not grow in a food containing a large proportion of sugar. Jelly, marmalade, and preserves keep well for this reason. Raisins, dates, figs, and candied fruits are other examples.

Salt.—Salt prevents bacterial growth in much the same way as sugar, and it also takes up moisture. While not used with fruit, many other food products such as fat pork, beef, fish, hams, and bacon are salted. Salt in butter and cheese makes them keep better.

Acids.—Acids protect from bacteria and give new flavors.

Vinegar (acetic acid) and sugar are used in making pickled fruits, such as cherries, crabapples, peaches, and pears.

Spices are antiseptic and are often used in connection with other preservatives and for flavor.

Canning powders used by many housekeepers are very harmful. Many of these powders contain salicylic acid or boric acid, and are sold under trade names as preserving compounds to be added to the food in the jar to prevent spoilage. These powders, while preventing decay, have very harmful effects upon the health.

CANNING

The Primary Principle in Canning.—The main point in canning is to sterilize by heat the food and everything that comes in contact with it, and then to keep it sterile. Bacteria increase in number so amazingly fast that, if a single germ withstands the heat or gets into the food after it has cooled, the contents of the jar will spoil in a few days. The jars must be sealed while hot, to insure that all enclosed air will be sterilized and to insure a perfect seal on cooling.

Why Foods Spoil.—Micro-organisms that cause foods to spoil may assume two forms, the spore, and the vegetative form. When conditions are unfavorable to their growth they go into the spore form, cease growing, and are inactive.

They are much more difficult to destroy in the spore form than in the vegetative form, and are able to resist even boiling temperature for several hours. During a dry season spores occur much more frequently on fruits and vegetables, which fact accounts for more spoilage some seasons than others. When organizms are in the vegetative form they feed on the food and produce changes in it, and sometimes poisons. When canned foods spoil after long boiling and careful sealing, the fault may be due to insufficient heat or heat applied for too short a time to destroy the spores which changed to the active form after canning. There are differ-

ent kinds of spoilage in canned goods: (1) Fermentation, (2) Flat sour, (3) Botulism, (4) Putrefaction.

Fermentation, called "swell" by commercial canners, is indicated by bubbles of gas in the jar and a bulging of a jar or top. Fermentation is due to lack of thorough sterilization and the action of yeast and bacteria within produces the gas. When fermentation occurs a few hours or a day or two after the food has been canned, a jar of food may be resterilized, and will be just as good as before fermentation occurred.

Flat Sour.—In commercial canning, a condition of canned products resulting in a very disagreeable odor and taste without any apparent change in appearance is called "flat sour." All foods of this kind should be destroyed. In canned vegetables there are more frequent cases of flat sour than in other foods, a result of the presence of organisms which produce an acid in the food. Flat sour may be prevented in a large measure by cooling all cans of food to 100° F. quickly after removal from the canner, and storing in a cool place.

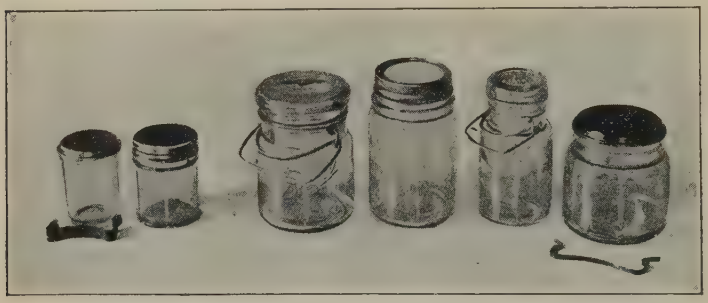
Botulism is a poisonous condition principally in protein foods that may be detected by its odor. Food of this character that is suspected should be thrown away.

Putrefaction is spoilage of food due to decay on account of imperfect sterilization or sealing. It may be detected by its repulsive odor. Such food must not be used.

Rubbers.—New rubbers should be purchased each year, since old rubber loses its elasticity, and will not make perfect seals. Good rubbers are elastic and will not break easily when stretched or folded over tightly. New ones that are hard and inelastic are no better than old ones. Good new rubbers, while adding a little more to the cost of canning each year, more than make up for it by saving food from any danger of spoiling. When rubbers bulge on a can it is probable that a clamp on the top is too tight.

Rubbers should not be boiled but should be dipped into boiling water just before putting them on the jars. Tops with the rubbers on them must be treated in the same way.

Jars for Canning.—There are many kinds of fruit jars on the market. The best jar is that which is strong and simple in construction, which has a wide mouth, and which protects the contained food against contact with metal. Use glass jars, never tin. Jars having a wide mouth are the best for large fruits, for it is easier to arrange the contents to better advantage.



Various types of jars used in canning.
Illustration by courtesy College of Agriculture, Madison, Wis.

To Test Jars.—Partially fill with water, adjust the rubber and the cover, seal, and invert the jar. If the defect is one which can not be remedied by a new rubber or a top, put the jar aside out of the way. It may be used for storing food in the ice box.

To Sterilize Jars.—Wash the jars and tops and submerge them in a pan of cold water, jars full of water; bring slowly to a boil and boil 10 minutes just before filling.

Let stand in the boiling water until ready to fill with food. Remove one or two jars at a time and fill quickly. Do not touch the neck or inside of jar with the hands. Use a long-handled spoon or fork which has been sterilized to handle the jars. When filling, stand jars on a hot wet cloth

or in a pan containing a little hot water to keep them hot and prevent breaking when hot food is put into them. Never let hot glass jars stand in a draft while cooling.

Methods of Canning Fruits.—Fruit may be canned in the home by the open-kettle method or the cold-pack method.

The Open-Kettle Method.—In the open kettle method the food is cooked in the kettle over the fire, then put in sterilized jars and sealed. The danger of this method of canning is that the product may become reinfected while it is being transferred to the jars. This method was formerly used for most fruits, but is now used mostly for making preserves and marmalades where the evaporation of some of the moisture is necessary. It may with care be used for fruits and tomatoes, but can not be successfully used in the canning of vegetables.

Directions for open-kettle method:—

1. Make the sirup required for the amount of fruit to be canned.

2. Test cans and tops. Wash thoroughly, and sterilize them. Sterilize all spoons and utensils to be used in the canning process.

3. Wash, pare, and prepare the fruit and remove all bruised or decayed portions.

4. If fruits are not used immediately after paring, cover with a wet cloth to prevent their discoloring.

5. Hard fruits should be first steamed or cooked in clean boiling water a few minutes to soften the hard fiber, before adding the sirup.

6. Fruits may be canned with boiling water without sugar, if preferred, or when sugar is high in price at canning time. The sugar can be added when fruit is prepared for the table. Rhubarb is usually canned in water, because it contains so much acid which preserves it without sugar.

7. Berries and small juicy fruits require very little water. Add the sugar directly to the fruit and let stand until some

of the juice runs from them before cooking. Cook over a slow fire to prevent burning.

8. Boil the sugar and water together 5 or 10 minutes, to make the sirup. Put in the fruit and cook until tender. Cooking a small amount at a time preserves the shape.

9. When fruit is tender, set the empty jar from the boiling water into a pan containing a little hot water, or on a wet, hot cloth. This cloth keeps the jar hot and avoids the danger of the jar's breaking.

10. Put a new sterilized rubber on the jar. Pack the fruit in carefully, arranging it to look well, and fill the jar to overflowing with the hot sirup. Put on the sterilized top and screw down tight.

11. See that no fruit around the edge prevents an air-tight seal. Set each jar upside down on a board away from any draft and let stand over night.

12. On the following day wipe the jars clean, see that each is perfectly sealed, and labeled. Store them in a dark closet. If any jar is not perfectly sealed, open it, boil the fruit, and recan as before.

The Cold-Pack Method.—The product is packed in the jars before it is cooked and the liquid (sirup or water) is poured over it to fill the jar. The jars are partially sealed and then sterilized the full time all at once. This method is shorter and easier, since it is impossible for any organisms to enter the product after it has been once sterilized and the food is handled only once. Materials retain their shape better and also more of their natural flavor and color. Vegetables and fruits are equally well preserved by this method.

The steps involved in the cold-pack method are, (1) blanching, (2) cold dipping, (3) peeling, (4) packing, (5) processing, and (6) sealing.

Blanching is the process of plunging the food product into boiling water. This eliminates objectionable acids and

reduces the large bulk of the food. Foods are more easily handled in a wire basket or cheesecloth square. Plunge into boiling water and allow to remain from one to three minutes or until the skins begin to loosen.

Only a small quantity of the food should be blanched at a time in order to keep the water as near the boiling point as possible.

Scalding is a shorter method of dipping in boiling water than blanching. It is used to loosen the skins of tomatoes and peaches. Berries and soft fruits are neither blanched nor scalded. Hard fruits and vegetables are blanched in order to save much shrinkage in the can.

Cold dipping consists in putting the basket containing the food directly from the boiling water into cold water. This hardens the pulp under the skin, makes the removal of the skins easier and brings the coloring matter to the surface.

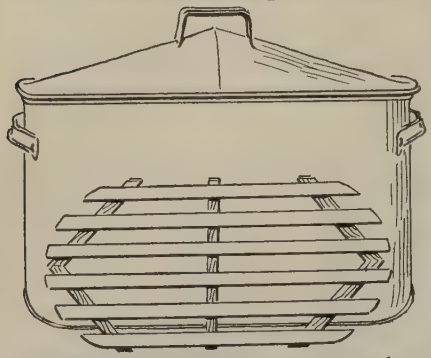
Peeling the food should then follow. This should be done with a sharp knife quickly and carefully and the food should be packed immediately into clean jars. Fill the jars full of food and add hot water or sirup to make them brimful, and partially seal.

Processing is sterilizing jars of fruit or vegetables in a canning outfit according to the time given in the table for each kind of food. At the end of the time given for processing, remove the jars, complete the seal and cool quickly. Examine carefully before putting jars away to make sure the seal is tight and that the material canned is in perfect condition.

Canning outfits for cold packing of food products consists of several kinds. (1) Hot-water outfits, (2) steam cookers, (3) steam-pressure outfits.

Hot water canners may be made out of any large kettle or boiler which is large and deep enough to hold several cans. A rack or false bottom is used to hold jars up from the bottom and allow a free circulation of water in the boiler. The cover must fit tightly to the boiler. A rack with handles for

holding jars and to help in lifting them out of the canner is necessary. Commercial hot-water canners come equipped with these racks. Large hot-water outfits for canning out of doors come equipped with fire box, also.



Sterilizer, showing false bottom as a rack—*Courtesy Extension Service N. Y. State College of Agriculture.*

Steam cookers are more economical and more easily handled than hot-water outfit. They are made of tin or copper and require much care in cleaning to keep in good condition. They may be used for cooking other foods at other times of the year. The time required for processing must be slightly increased over that required for the hot-water bath outfits, since the temperature is likely to be lower.

Steam pressure cooker showing jars in position.—*Courtesy Extension Division, Department of Agriculture, University of Minnesota.*

Steam-pressure cookers are the best canners for canning vegetables and meat on account of the greater degree of heat which they are able to obtain. Steam under pressure reaches a much higher temperature than boiling water and the rise in temperature increases as the pressure is increased. The pressure of ten pounds in the canner gives a temperature of 240° F. The high temperature obtainable thus makes it possible to can foods in one period which simplifies the process, saves time, han-

dling, and heat. Steam pressure cookers have a gauge for determining the steam pressure, and a thermometer. The automatic safety valve regulates the pressure when set at a given point.

Selection of Fruit.—Buy only fresh, firm fruit of good quality and not too ripe. Overripe fruit may contain some bacteria that will not be killed by boiling, causing fermentation after the fruit is set away. Buy fruit in season when prices are best. Fruits that are grown in one's own vicinity are more likely to be of better quality for canning than those that have been shipped long distances.

Proportion of Sugar and Water for Sirup.—The density of sirup for canning fruit depends upon the acidity of the fruit used and the type of canned product desired. The density of the sirup does not make any difference in the keeping qualities of the canned product.

Thin sirup, use 1 part sugar to 3 parts water.

Medium sirup, use 1 part sugar to 2 parts water.

Thick sirup, use I part sugar to 1 part water.

A thicker sirup for very acid fruits such as gooseberries and currants may be made by boiling the thick sirup until it spins a thread.

Method.—Put the sugar and water in a granite kettle over a slow fire. Stir the sugar until it is all dissolved in the water and boil 8 to 10 minutes. The longer time is required when there is a larger quantity of sirup.

Use thin sirups for sweet fruits, such as pears, raspberries, pineapples.

Use medium sirups for acid fruits, such as strawberries, cherries, plums.

Use thick sirups for preserving and for keeping large fruits whole.

Thin or medium sirups are used for most fruits.

Different fruits and also the difference in packing fruit in a can varies considerably and makes it hard to estimate

the amount of sirup to use. In general, in making sirup allow 1 c. water for each 1 pound of fruit to be canned.

Directions for the cold-pack method:—

1. Select fresh, firm not overripe fruit. Can it as soon as possible after it has been picked.

2. Wash, pare, and remove bruised and decayed portions. Wash berries thoroughly in a wire basket.

Prize jars of apricots and yellow crab apples canned by the cold-pack method by students doing girls' club work at Winona, Minn.

3. Blanch fruits needing it in boiling water. Berries do not require blanching.

4. Cold dip fruits after blanching.

5. Pack fruit closely in clean jars to within a half inch of the top.

6. Place a new rubber on jar.

7. Fill jar to overflowing with boiling sirup or boiling water. If there is not quite enough sirup to fill the last jar

in packing, fill the remaining space with boiling water.

8. Adjust cover and partly seal. Pack and seal one jar at a time.

9. Process, or boil, jars on a rack in the hot-water outfit in boiling water deep enough to cover the jars 1 inch. Cover the canner and, when the water begins to boil, count the time and process for the required time given in the table under application. Keep water boiling during the entire process. Process the jars in a steam-pressure cooker according to the table, and set the gauge for the pressure desired.

Open petcock till steam escapes. Do not begin to count time till the proper temperature which the contents requires is reached.

10. When time for processing is over remove rack containing cans or jars from hot water outfit. Seal jars and invert them to cool as quickly as possible. If the steam-pressure cooker is used, allow the pressure indicator to go back to zero before opening the petcock. Open this carefully to allow steam to escape slowly. When steam ceases coming out release the clamps on the cooker, remove the jars, seal, and invert.

11. Examine jars next day to see whether the seals are perfect. Wipe thoroughly, label, and store in a cool place.

12. Jars with imperfect seals should receive attention at once. Heat the fruit to boiling point, sterilize a new jar and top, and can over again. More sirup will be needed or boiling water may be used to fill the jar.

The presence of air in a can will not cause spoilage of the food if the air is sterile and the seal is tight. It is not necessary to run a knife down in a can to let out air bubbles. To do so only endangers the food, since the knife may hold organisms which will get into the food. Nor is it necessary to add more liquid to the can after sterilization. Never remove the top of the can once sterilized, until the food in the can is to be used.

Strongly acid foods require very little heat for preservation. Examples are: Rhubarb, cherries, strawberries, red raspberries, gooseberries, currants, pineapples, and tomatoes.

Moderately acid foods containing some protein require a moderate amount of heat. Examples: Apples, pears, quinces, peaches, plums, grapes, blackberries, and black raspberries.

PRESERVES

Some fruits, like strawberries, sour cherries, quinces, currants, crab apples, and sour plums are preserved by cooking in a thick sirup by the open-kettle method and sealed as other canned fruit is. Strawberries and cherries require 1 pound of sugar to each 1 pound of fruit. Other fruits have a better flavor when only three fourths of a pound of sugar is used to each pound of fruit. The same quantity of water is required as in canning.

QUESTIONS AND PROBLEMS

1. What causes fruit to mold and decay?
2. Should berries be washed as soon as delivered or not?
3. Which is better, to wash strawberries, with or without stems?
4. How does the temperature obtained, if there is a ten-pound pressure in a steam-pressure cooker, compare with that of boiling water?
5. Why are new rubbers necessary each year?
6. Why do some fruits discolor after paring?
7. Why do we use a wet cloth or a pan of water under a hot jar when filling it with canned food?
8. Why is it wise to label all jars?
9. What kind of a storage place is best for canned food?
10. Would it be well to put the date on the label of the jar?
11. Is a record of all jars canned in a season of any real use?

APPLICATION

Can some fruit by the open-kettle and some by the cold-pack method. Compare time required, appearance of fruit, and labor required.

1. Canned Peaches

Method.—Wipe peaches and put in boiling water, allowing them to stand just long enough to loosen the skins. Remove the skins and

either cook fruit at once, that it may not discolor, or drop into cold water. Make a medium sirup and bring to a boil in a preserving kettle. Put fruit in and cook 10 or 15 minutes or until tender. Bring to a full boil and then fill jars according to previous directions. The fruit may be cut in halves and a few of the stones put into the sirup for flavor.

One section of the class may can according to open-kettle and the other section may use the cold-pack method.

(*Basis for* 2 *girls*, 1 *can.*)

2. Canned Pears

Method.—Wash and pare the fruit. Cook whole with or without stems; or, remove stems, cut in quarters or halves, and core. Put at once into cold water. Make a thin sirup, bring to a boil, drain the pears, and place in the sirup. Boil until tender. Place each piece separately in the jar with a fork; then cover brimful with the boiling sirup, and seal. Bartlett pears are best for canning.

(*Basis for* 2 *girls*, 1 *can.*)

3. Canned Plums

Method.—Wash the plums and prick them to prevent bursting. Add the plums to the medium sirup, cook until tender, and can according to either method.

4. Canned Strawberries (Open-Kettle)

Method.—Select highly-colored, clean berries. To 10 pounds of berries add 3 to 5 pounds of sugar. Place berries in a preserving kettle and mix in the sugar thoroughly. Allow them to stand 5 to 10 hours, until the juice begins to run into the sugar. Place the kettle and contents on the stove and bring to a boil. Simmer 15 minutes, keeping the berries beneath the sirup with a spoon and removing scum that rises. Place in jar and seal.

Note.—Blackberries and raspberries may be canned the same as strawberries. Use 2½ pounds of sugar for 10 pounds of berries. Berries when canned according to the cold pack method hold their shape better.

5. Mixed Fruits

Three or more sweet fruits, as peaches, pears, white cherries, or pineapple, canned together, make convenient salad combinations. They may be used for fruit cocktails, desserts or salads.

Method.—Prepare as when canned separately, pack in layers to fit tightly. Fill cans full, add sirup to fill the jars. Place on rubbers, partly seal top, and process the same as other fruit. Seal tightly when the processing is over.

TIME-TABLE FOR CANNING FRUIT BY COLD-PACK METHOD

Fruit	Preparation	Time of Blanching	Kind of Sirup	Time of Cooking	
				Water-bath Outfit	Pressure Cooker
		Minutes		Minutes	Min. Lbs.
Apples	Peel, core, cut up	1—2	Medium	20—30	10—5
Apricots	Peel, core, cut up	1—2	Medium	16	10—5
Blackberries	Pick over, wash	——	Medium	16	6—5
Cherries	Wash, stem, pit	——	Med. thick	16	10—5
Fruit juices		——		20	10—5
Grapes, plums	Wash, stem	——	Med. thick	16	10—5
Huckleberries	Clean	——	Med. thick	16	8—5
Peaches	Blanch, peel, stone	1—2	Medium	16	10—5
Pears	Blanch, peel, core	1—2	Thin	20	10—5
Pineapples	Peel, slice	——	Thin	60	40—5
Quinces	Peel, core, cut up	1—2	Thin	60	40—5
Raspberries	Pick over	——	Thin	16	8—8
Strawberries	Pick over	——	Thin	16	10—5

Suggestion to the Teacher.—Assign the topic of canning outfits. Get illustrations, descriptions, and prices. Discuss relative merits of different kinds, and illustrate the talk with outfits, if possible.

HOME PROJECTS

1. Can some fruit at home, using the cold-pack method.

2. Keep a record for future use of all food canned in the home this season, and estimate the cost per can, using the following little outline for your records:—

Date	Quantity of food as purchased	Cost	Quantity—sugar used	Cost	No. Jars Qts. Pts.	Cost per Qt.
June 9	1 case strawberries or 16 boxes—	$2.90	4 lb. sugar	36¢	16	20¢
	No fuel is estimated.					

Suggestion.—Canned fruits and jellies may be sold at a sale or by private orders to take care of the cost of lessons. Each girl should work alone and can at least one jar according to each method.

LESSON 34

PRESERVATION OF FOOD

Vegetables—Meat

Vegetables, except tomatoes, are more difficult than fruit to can successfully, because they are harder to sterilize. They contain much hard cellulose fiber, very little acid, considerable protein, consequently require long cooking; and the spores (seeds) of certain bacteria, which resist ordinary boiling, are also usually present.

Peas, beans, asparagus, and corn may, nevertheless, be easily canned in the school and the home, if the correct method is followed.

The cold-pack method of canning is the only one used for canning vegetables and meat. There are two methods of applying the heat in cold packing vegetables.

1. *The single-period* sterilization method of cooking the food in the jars, as in processing fruits. This is the easiest and best method.

2. *The intermittent* sterilization method. In this method the vegetables are packed into clean jars and sterilized an hour or more for three successive days. This method necessitates the handling of jars many times, the use of more fuel, and several days' labor. Long heating tends to produce too soft a product when used for young or leafy vegetables. The intermittent method can be used successfully only with root vegetables, legumes, and foods requiring a high temperature.

As we have learned, some bacteria are able to form spores, which are like seeds, that are not killed by ordinary boiling. Soon after the food has cooled, these spores germinate, when they may be killed easily by heating. A second cooling and a third heating, as in intermittent cooking, will render the vegetable absolutely sterile.

The steam-pressure cooker is the best canner for vegetables and meats.

Use of Acid in Canning Vegetables.—When a water-bath outfit is used for canning vegetables, there is more danger of imperfect sterilization, because the temperature is not as high. A small amount of acid (vinegar or lemon juice) added to each jar of vegetables difficult to can (corn, beans, peas, asparagus, and greens) helps to preserve them more successfully. This acid method does not change the flavor to any great extent.

Proportion of Acid to Use.—To each quart jar of vegetable add 1 teaspoonful of salt and 1 tablespoonful of acid.

Selection and Preparation of Vegetables.—Select only sound, fresh, young, and tender vegetables. If possible, can vegetables on the day they are picked. It is especially necessary to do so with beans, asparagus, and corn, if the best flavor is desired.

Pare, peel, or scrape, as the kind of vegetable requires. Remove all bruised or decayed parts.

If the vegetable is likely to discolor after being pared, cover with cold water until ready to use; if very large, cut into convenient size to can.

Wash jars and tops thoroughly and test for seal.

Sort vegetables according to size, using one size only in a jar. Blanch a few vegetables at a time in boiling water deep enough to cover or in steam. In blanching in steam the vegetables can not be placed very close together or the steam will not penetrate to all parts. Spinach and delicate-flavored greens may be blanched in steam. Boiling water is best and quickest for other vegetables.

Vegetables that have been picked for some time are sometimes improved by soaking in cold water before blanching.

Greens should be blanched about 5 minutes or until thoroughly shrunken, to reduce the large bulk.

Corn is blanched on the cob.

Asparagus is tied in bunches, placed in boiling water upright, with the tips above the water, and blanched 2 minutes.

Root vegetables, as beets, parsnips, and carrots are blanched until the skins loosen.

Peas, cauliflower, and asparagus tips do not require blanching when fresh.

Prize jars of carrots and wax beans canned by the cold-pack method by students doing girls' club work at Winona, Minnesota.

Cold dip vegetables only long enough to make them cool enough to handle. They should be cold-dipped immediately after being removed from the boiling water.

The One-Period Method of Canning Vegetables:—

1. Pack the vegetables firmly into the jars to within half an inch of the top. Arrange in a manner to utilize the space well and to present a good appearance.

2. Add salt to the vegetables, allowing ½ to 1 teaspoonful to each quart. If sugar is desired, as in beets and peas,

add 1 to 2 teaspoonfuls to each quart. Then fill jars to overflowing with clean, hot water.

3. Place the tops on the jars part way, but do not seal. Then place the jars on a wooden rack or other support in the canner.

4. Sterilize in steam-pressure outfit, if possible, according to time given in the table. Close canner and set gauge for pressure. Count time accurately.

5. If a water-bath outfit is used, set jars in the rack and lower rack into the hot water in the canner. The water should cover the jars at least 1 inch deep.

6. Cover the canner and, when the water boils, begin to count the time for sterilizing for the water-bath outfit.

7. When time for sterilizing is over, remove jars from canner, seal tightly, invert, and cool quickly. Avoid a draft.

8. Test seal next day. Wipe jars, label, and store.

The intermittent method of sterilization is the same with the exception of the time allowed for sterilizing. The jars are partially sealed when placed in the canner and sterilized according to time-table. Then jars are completely sealed and sterilization continues for the remainder of the first day period as given. Sterilizing the second and third day is done in the same manner without loosening the seals of the jars. Bring water to boiling point and boil hard to full 60 minutes. Then remove jars, invert, and cool. The fourth day test seals, wipe jars, label, and set away.

To Use Canned Vegetables.—Inspect all canned vegetables before using, to be sure they are in condition to use. If the can is tin, turn all the vegetable out as soon as opened. Boil vegetables in their own liquor at least 10 minutes to make sure they are safe for use. Any excess liquid with the vegetables may be used for creamed soups. Use canned vegetables in any way in which freshly cooked vegetables are used. The flavor of canned vegetables is improved if the

can is opened early and the contents poured into a bowl to aerate an hour before they are prepared for the table.

PRESERVING MEATS

Animal tissues and products are very susceptible to the action of bacteria. Putrifaction results or poisonous ptomaines may develop and render the food dangerous to life.

Various meats may be preserved for safe storing and convenience. Different processes are employed for this purpose.

Canning.—Chicken, game, and beef may be canned. These can be sterilized in jars by the cold-pack continuous, one-period method. Only a steam-pressure outfit is satisfactory for meat canning.

Smoking.—Meats and fish are often preserved and flavored by smoking, combined with the salting and drying that accompany the process. It must be remembered, however, that the smoke does not penetrate deeply into the flesh, but is merely a protective covering, so that any bacteria or parasites within are not killed. Smoked meat is unsafe to eat without thorough cooking.

Pickling.—Meats are often pickled, as corned beef, tripe, and pigs' feet. They are soaked in brine composed of salt, sugar, saltpeter, and water. The nutritive value is slightly impaired.

Salting is a common way of preserving fish and meats.

Directions for canning meats:—

1. Select meat as fresh as possible.
2. Tough meats are just as good as tender cuts for canning.
3. Remove surplus fat and large bones which take up room in the can.
4. Wipe meat off with a damp cloth.
5. Cut meat into convenient-sized pieces for packing.
6. Wash jars and tops and test the seal. Use new rubbers.

7. Pack raw meat solidly in jars to within 1 inch of top.

8. Add 1½ tsp. salt to each 1 quart can of meat, and any other flavoring, if desired.

9. Add no water to the can. Put on covers and partly seal jars.

10. Process under 10 pounds of pressure for 2 hours. Then seal, test, label, and store.

EXPERIMENTS

Growth of Molds and Bacteria

1. Put a small piece of bread in the sun and air. Let it stand until next lesson.

2. Cover a dry piece of bread in a dark place and let it stand.

3. Dampen a small piece of bread, cover, and stand in a dark corner of the cupboard until next lesson. Examine the three pieces and compare results.

Protein and Acid Foods

4. Let a small portion of cooked beans or peas stand in the cupboard a few days uncovered.

5. Let a dish of cooked apples without sugar stand a few days uncovered. Is there any change, and which one is affected first?

Protein and Starchy Foods

6 Put a piece of cheese on a dish in the ice box uncovered for a few days.

7. Put a soda cracker on a dish in the ice box in the same way. Does any change occur in experiments six and seven? What is the difference?

Effect of Salt, Sugar, Acid, and Low Temperature

8. Put 1 tsp. of Hamburg in each of 5 test tubes. Add ½ tsp. salt to the top of one, ½ tsp. sugar to the second, ½ tsp. vinegar to the third. Add nothing to the fourth, and let all four stand at room temperature for 3 or 4 days. Set the fifth without any addition in a cold ice chest for three or four days. Compare. Did any change occur? Which was affected most, and what conclusions do you draw?

QUESTIONS AND PROBLEMS

1. Why are vegetables more difficult to can than fruits?
2. What is blanching used for?
3. Why are acid foods less liable to spoil?
4. Why should the water be boiling in the canner before beginning to count the time for sterilizing.

APPLICATION

Canning vegetables by both the intermittent and the cold-pack methods according to the following tables.

CANNING VEGETABLES

COLD PACK (INTERMITTENT METHOD)

Vegetable	Preparation	Cook out of jars	Cook in jars without cover	Cover and Cook		
				First day	Second day	Third day
Asparagus	Wash: grade to size	.....	15 min.	45 min.	60 min.	60 min.
Beans—string	String; wash thoroly	15 min.	20 min.	60 min.	60 min.	60 min.
Beans—Lima	Wash	15 min.	15 min.	60 min.	60 min.	60 min.
Beets	Wash	15 min.	15 min.	45 min.	60 min.	60 min.
Carrots ¶	Wash: scrape	15 min.	15 min.	45 min.	60 min.	60 min.
Corn	Cut grains off cob.	20 min.	45 min.	50 min.	60 min.	60 min.
Peas	Select young: sort to size	15 min.	15 min.	45 min.	60 min.	60 min.
Tomatoes	Scald and peel	15 min.	15 min.	45 min.	60 min.	60 min

COLD PACK (ONE-PERIOD METHOD)

Vegetables Meat	Preparation	Blanch minutes	Water bath minutes	Steam pressure	
				minutes	pounds
Asparagus	Clean, sort	3-4	90	40	10
Beans, string	String, grade	3-5	120	40	10
Beans, shell or Lima	Clean, grade	3-5	120	60	10
Beets, acid method	Grade, wash	3-4	90	40	10
Carrots	Scrape, cook	¾ done	90	40	10
Cauliflower	Wash, separate		90	40	10
Corn, off cob	Husk, cut off cob	5-15	180	80	15
Corn, on cob	Husk, grade	5-15	180	80	15
Okra	Can on day picked	2-5	180	40	10
Parsnips	Peel, cut	3-5	90	40	10
Peas	Shell, sort to size		120	50	10
Pumpkin	Peel, cut in pieces	15	180	60	
Rhubarb	Cut in in. pieces. Pack in jars. Fill with cold water. Seal				
Spinach and Greens	Wash well	5	90	90	10
Soup mixture (layers of different vegetables)	Cut in small pieces fill cans	5	120	90	10
Squash	Peel, cut in pieces	15	120	40	10
Succotash	fill cans	15	160	80	15
Tomatoes	Use no water		160	80	15
Tomatoes and corn, mixed	Grade. Use no water.		160	80	15
Meat				120	15
Fowl				120	15
Fish				90	15

This table is for quart jars. If vegetables are canned in pint jars, decrease the sterilizing time as given in the table by 5 minutes. If 2-quart jars are used, increase the time for sterilizing 25 minutes.

1. Soup Mixture

2 qt. tomato pulp	2 tsp. salt
4 c. corn	2 tbsp. sugar
2 c. tiny lima beans	Pepper to taste
1 small onion	2 stalks of celery

Method:—Slice the onion and celery. Add to the tomato pulp, corn and beans. Add seasonings and cook all together slowly for 20 minutes. Put into hot, clean quart jars—add rubbers, and partially seal tops. Process for 2 hours in a water-bath outfit for 60 minutes with 15 pounds pressure, if a steam-pressure cooker is used.

2. Rhubarb

Select the young tender stalks of rhubarb which matures quickly in the early part of the season. Trim off the ends, wash thoroughly and cut into even length pieces one inch long. Pack clean jars full of the pieces, being careful not to crush them. Add water or sirup to fill the jars. If sugar is high in price, the water is just as good as the sirup, since the acid in the rhubarb acts as a preservative, and the sugar may be added when the product is to be used. If sirup is used, use ½ c. of sugar to each qt. of water.

Seal and process in water-bath for 15 minutes at 212° F.

STANDARDS* FOR CANNED FRUITS AND VEGETABLES

Color: As near that of the natural fruit or vegetable as possible.

Clearness: Sirup or liquid clear and free from seeds, and sediment.

Pack: Arrangement with reference to symmetry and best use of space. As large a proportion of solids to liquids as possible. Uniform shape and size.

Containers: Uniform and of size and shape. Labels, neat.

Flavor: As near like natural flavor as possible. Canned fruits should not be sweet.

Texture: Tender but not overcooked. Uniform, ripened products. No defective or overripe fruits or vegetables. Only young and tender vegetables should be used.

STANDARDS* FOR CANNED MEATS

Texture: Firm, well cooked, not broken by overcooking.

Flavor: That of freshly cooked meat. The greater portion of the natural juice should be retained in the meat.

*Adapted from Cornell.

SCORE CARD FOR CANNED FOOD*

Apperance		30
Color	10	
Clearness	10	
Pack	10	
Arrangement		
Uniformity of size		
Container		10
Appropriateness		
Neatness		
Label		
Quality of contents		60
Flavor	40	
Texture	20	
		100

HOME PROJECTS

1. Can some food at home during the week by cold-pack method.
2. Find out the names of jars used for canning and compare with the best ones for use and for the price.

*Adapted from Cornell.

LESSON 35

PRESERVATION OF FOOD

Drying

When fresh vegetables are plentiful and cheap or when the home garden has an excess supply of them, it is a great extravagance not to prepare them in some way for winter use, and help reduce the cost of food. Vegetables and some fruits may be dried very successfully. The removal of moisture makes them bacteria proof, reduces the bulk eighty to ninety per cent, and does not greatly affect the flavor or food value. Dried food is easily stored in paper sacks, and does not require the expenditure of any money for glass jars and tops. It is the least expensive method of preserving food. If an ample supply of containers is available, it is better, however, to can vegetables with one operation, since drying requires more time and attention.

Methods of Drying.—Food is dried by the application of heat, as in (1) sun drying, or (2) drying by artificial heat, and (3) drying by air blast.

Sun drying requires no expense for fuel and there is no danger of overheating the food. Drying by artificial heat is accomplished by placing food on trays in a heated oven, or suspending over a hot stove, or by dry steam. Drying by air blast or by electric fan is accomplished without any heat. The free circulation of air is effective without heat.

A combination of oven heat with air blast is used most frequently for drying by artificial heat in the home.

Equipment for Drying.—For drying on a small scale, large plates or a tray may be used for food. For drying on a large scale, large shallow trays should be used. They should be of uniform size so that they may be stacked together for convenience in handling. The bottom of the trays is made of wire netting which permits the air to circulate under the food. When food is dried in the sun the

sides, bottom, and top of trays must be protected from insects and dust by cheese cloth. A glass over the top of the trays permits the entrance of the sun's rays, and keeps food clean. Space must be allowed for the air to enter and the moisture to evaporate. Window screens may be used as racks to hold the food. Commercial driers for use in the oven or for suspending foods over a stove as well as trays for holding food may be purchased, if desired.

Selection of Foods for Drying.—Small vegetables and fruits, like corn (cut from cob), peas, shell beans, lima beans, berries, and cherries are dried whole. Large vegetables and fruits like beets, carrots, asparagus, apples, peaches, pears, quinces, and pumpkins are sliced in one eighth to one fourth inch slices, or cut in narrow strips. Food choppers and shears may be used to cut food for drying, if preferred.

Food to be dried should be in good condition, fresh, mature, not overripe, free from bruised spots, perfectly clean, and peeled. All knives used for cutting should be clean. There should be no discoloration on the vegetables from the knives used for cutting.

Blanching is necessary for foods to be dried. It removes all objectionable odors, softens the fiber so that a quicker and more uniform evaporation occurs, and improves the color. Blanching is accomplished in the same manner as in the cold-pack process of canning.

Drying.—Foods for drying need no cold dipping after blanching, but should have the surface moisture removed by placing them between clean sterile cloths a few minutes.

Spread the food on the drying trays evenly, and protect from dust. Stir or turn twice a day while drying.

For sun drying set the protected trays in the sun, and in a breeze, if possible. (This method requires several days or a week.) Return trays to the house or shelter at sundown and in rainy weather.

For oven drying set the trays of food in the oven. The heat should be very low as in a slow oven, and the heat controlled to prevent scorching of the food. Leave the oven door open slightly to allow the moisture set free by evaporation to pass off. An oven thermometer must be used to gauge the heat accurately. The heat should range from 120 degrees to 175 degrees, the temperature being lowest at the beginning of the process and increased gradually as the food dries. Food may be dried in the oven in 10 to 12 hours.

For top stove drying suspend the trays containing the food at least six inches above the stove or heat. If several trays are used stacked together, change the position occasionally, those from the bottom to the top, and *vice versa*, so that the food will be dried uniformily.

For air blast drying arrange the trays containing the food to be dried in front of the air current produced by an electric fan. See that no food is blown from the tray, and that the layers of food remain even. Change position of the trays occasionally to dry the food evenly. Air blast dries thinly-sliced foods in 5 or 6 hours, and larger foods in 24 hours.

Care after Drying.—Foods dried in the sun or by an air blast require extra precaution to insure the perfect cleanliness of the dried product. Set the dried food in an oven of 160° F., for 5 or 10 minutes before storing it away, in order to destroy any insect growth which might have been exposed to the food while drying.

Test for Dried Foods.—There is no definite time schedule for drying foods as in canning, but a few tests are used to determine the condition of the food as follows:

1. Freshly dried vegetables should be brittle, while freshly dried fruits should be pliable and leathery.

2. Squeeze a portion in the hand. There should be no moisture left in the hand.

3. Fruit and vegetables that stick to the hand after being squeezed are sufficiently dried without being brittle.

Conditioning.—All dried foods should be conditioned before being stored, that is, they should be placed in boxes, and changed or poured from one box to another each day for four or five days. If any portion of the food is moist, it should be returned to the drier for a short drying.

Storage for Dried Products.—Tin boxes with tight covers (the kind that coffee comes in), strong paper bags, and the patented paraffin paper boxes make good containers for storing dried products. Seal the top of boxes with a strip of adhesive tape, and tie or twist the top of paper bags tightly to make seals tight enough to insure clean food. Label plainly. Small containers are easily handled and opened. Store in cool dry place, well ventilated and free from dust.

Careful storage is necessary to keep dried foods free from moisture, dust, and insects. Spoilage is often caused by improper storage.

To Use Dried Products.—Before using, all dried foods require long soaking. Cook in the water in which they are soaked in a covered saucepan at a low temperature to insure the best flavor. One cup of dried foods requires from three to four cups of water for soaking and cooking. Cook and prepare for serving in the same manner as fresh vegetables. Two ounces of dried soup vegetables will make three or four ounces of vegetable soup. A little seasoning of celery, mustard, onions, cheese, or nutmeg oftentimes adds to the flavor of dried vegetables when cooked.

QUESTIONS AND PROBLEMS

1. What is the principle of drying food?
2. What ways are used for drying food?
3. What way takes the longest time?
4. What must be done to all dried fruit before cooking?
5. Why may dried foods be stored without being hermetically sealed?
6. Why seal them at all?
7. Is there any difference in the flavor of food that is dried or canned?

8. Why is an oven thermometer necessary for drying food?
9. Why is conditioning all dried foods necessary?
10. What is the cost of drying food?
11. What happens to damp clothes thrown into the clothes basket in warm weather?
12. Is this mustiness anything like the mold on fruit?
13. What should you do with damp towels to prevent this?
14. What makes apples decay in the barrel?
15. What makes oranges decay in a sack or crate?
16. What care could you give as a preventive?

APPLICATION

1. Dried Corn

Method.—Green corn that is right for table use should be selected for drying. Dry as soon as possible after it is gathered in order to retain its flavor. (Left-over cooked corn on the cob may be mixed with sugar and salt and dried.) Blanch corn on cob 5 to 10 minutes. Cut off the kernels, using a sharp knife, cutting from the small end down. Do not cut too close to cob. Place corn in thin layers in drying trays and stir occasionally. Corn may also be dried with some sugar and salt. To each 5 quarts of corn add ½ c. sugar and ¼ c. salt. Mix corn, sugar, and salt, and put the pan in a larger pan containing boiling water. Stir often until the milk has been absorbed. Then spread corn on racks and dry in oven over stove or an air blast, stirring frequently.

2. Dried Cherries

Method.—Wash thoroughly and remove surface moisture by spreading between towels. Cherries are best pitted. The juice may be used for jellies. Spread in thin layers in trays. Put in a pan over hot water and steam 10 minutes. Cherries may be sprinkled with sugar before they are dried, if desired. It tends to improve their flavor. Dry and store as other food. To use, soak over night and simmer until tender. Add sugar at the last, as in cooking fresh fruit.

3. Dried Berries

Method.—Wash berries and remove surface moisture between towels. Spread in thin layers on trays and dry slowly, starting with a temperature of 110 degrees and increasing to 125 degrees in 2 hours. After much of the moisture has evaporated the last 2 hours the temperature may be increased to 140 degrees F.

Dried berries may be used in any pudding, muffins, pie, or with breakfast cereal.

When stewed, add sugar the last few minutes of cooking.

Time-Table for Drying Foods

With approximate time required for blanching and drying vegetables and fruit and temperatures to be used in drying by artificial heat.

Vegetables	*Blanching time*	*Approximate drying time*	*Temperature (Fahrenheit)*
	Minutes	*Hours*	*Degrees*
Garden peas	3 to 5	3 to 3½	110 to 145
Green string beans	6 to 10	2 to 3	110 to 145
Lima beans (young)	5 to 10	3 to 3½	110 to 145
Okra	3	2 to 3	110 to 140
Spinach, parsley and other herbs		3	110 to 145
Sugar peas	6	3 to 3½	110 to 145
Sweet corn	5 to 10	3 to 4	110 to 145
Wax beans	6 to 10	2 to 3	110 to 145
Fruits			
Apples		4 to 6	110 to 150
Apricots		4 to 6	110 to 150
Berries		4 to 5	110 to 140
Cherries		2 to 4	110 to 150
Peaches		4 to 6	110 to 150
Pears		4 to 6	110 to 150
Plums		4 to 6	110 to 150

HOME PROJECTS

1. Dry some vegetable or fruit by sun drying during the coming week.
2. Dry some vegetable in the oven, if possible, sometime within the next two weeks.
3. Cook some dried food once during week.

LESSON 36

PRESERVATION OF FOOD

The Use of Much Sugar—Jellies

When sugar is used in large quantities in cooking it aids in preserving the food, because it produces a condition unfavorable to the growth of bacteria.

Jellies, jams, marmalades, and conserves are made by cooking fruit juice or entire fruit with an abundance of sugar.

JELLIES

The ideal jelly is well colored, well flavored, transparent, tender, holds it shape when turned from the glass, and is not gummy or tough.

Composition of Fruit Juice.—Fruit juice consists largely of water in which are dissolved small quantities of sugar, flavoring material, vegetable acids, and pectin.

Pectin is the essential substance without which it is impossible to make jelly. Pectin is a carbohydrate similar to starch in its nature and, like starch, is dissolved in boiling water. It exists in small quantities in raw fruits, the amounts varying with different varieties. Cooking causes the pectin to absorb water, which increases it and gives it the jelly-making properties. Overripe fruits do not contain enough pectin to jelly, for the ripening process changes it to a form of sugar. Fruit not quite ripe is usually best.

The Pectin Test.—To determine whether a fruit juice can be used alone for making jelly or whether more pectin will have to be added, use either of the following tests:

Alcohol Test:—Ethyl alcohol is best for testing. Wood or denatured alcohol may be used, but only with care, since they are poisonous.

Add 1 tbsp. of alcohol to 1 tbsp. of cooked fruit juice. If the mixture contains much pectin, it will become thick like gelatin. If there is only a small quantity of pectin present,

it will collect in small particles. Because alcohol tends to dissolve pectin in a short time, the test must be watched closely as the alcohol is added to the juice.

Epsom Salt Test:—This may be used to test for pectin, but requires a much longer time than alcohol. Add 1 teaspoonful of sugar, ½ teaspoonful of Epsom salts to 1 teaspoonful of cooked fruit juice. Stir the mixture until salts are dissolved and let stand 20 minutes. If the mixture becomes a thick jelly-like mass the juice contains sufficient pectin for making jelly.

How to Add Pectin.—If a juice does not contain pectin in sufficient quantity for making jelly, some fruit juice which contains a large portion of pectin or a prepared pectin must be added in order to make jelly. Apple juice is the most commonly used fruit juice to combine with fruit juices lacking in pectin. Add sufficient pectin to the juice to give a good pectin test in the general proportion of about half as much pectin as fruit juice. Count pectin and fruit juice as so much juice in estimating the proportion of sugar.

Fruit juices which *lack pectin* are: strawberry, rhubarb, pineapple, cherries, apricots, and peaches. They make good jellies, however, with the addition of pectin.

Commercial pectin is made from apple skins and cores, and is available in most markets.

Homemade pectin is made by grinding the white portion of lemon, orange, or grapefruit rinds through a food chopper. To ½ pound of pulp add 3 cupfuls of cold water, and 3 tablespoonfuls of lemon juice. Let this stand 4 hours, then boil 10 minutes. Then let stand over night and boil again in the morning for 5 minutes. Strain through a fine cloth and it is ready to use. If it is to be kept any time, pour it into clean jars and sterlize in a water-bath canner 30 minutes, then seal.

Vegetable acids are also necessary in fruit juices for jelly-making and give flavor to the jelly. Fruit juices con-

taining considerable acid give a more tender jelly than the juices containing little acid. Many fruits containing pectin are deficient in acid. In order to make good jelly from these juices some acid (tartaric or citric) or some fruit juice rich in acid should be used with them.

Fruit juices *rich in pectin and acid* which may be used alone for making jelly are: currant, grape, sour apple, crab apple, plum, red and black raspberries (unripe), blackberries, cranberries, gooseberries, and quince.

Fruit juices which *lack acid* are: peach, sweet apple, pear, and strawberries.

A fruit juice which requires the addition of both pectin and acid before it can be used for jelly is elderberry.

The Acid Test.—To determine whether a fruit juice contains enough acid, taste it. If it has about the same acidity as a sour apple, it contains sufficient acid for good jelly.

How to Add Acid.—There are several ways of adding acid to fruit juices lacking in acid.

1. Add fruit juices rich in acid such as sour or crab apple, currant, green grape, rhubarb or pineapple in the proportion of equal parts with fruit juices lacking in acid.

2. Add lemon juice or the juice of any citrus fruit in the proportion of 1 teaspoonful to each quart of fruit juice.

3. Add powdered tartaric or citric acid in the proportion of at least 1 teaspoonful to each quart of juice. Dissolve it thoroughly. Some fruit juices may require more acid. This fact may be determined by tasting, as in acid test.

Fruit that is a little underripe makes the best jelly.

Combining proper fruit juices supplies both pectin and acid where they are deficient and in most cases gives better results in both texture and flavor than the juice of one fruit used alone with an extracted pectin.

Utensils for Jelly-Making.—Use a granite or porcelain kettle; a large wooden or enamel spoon for stirring; a pointed bag made of Canton flannel, cheesecloth, or old damask

through which to strain the jelly; an enamel pitcher or cup for filling glasses; sterilized jelly glasses; and a silver spoon for testing the jelly.

Method of extracting fruit juices for jellies:—

1. Select sound fruit that is not overripe. Pick over, wash until thoroughly clean and free from sand and dirt. Cut up large fruits.

2. Put in the preserving kettle and, if the fruit is very juicy, add just enough water to prevent burning, about 1 cupful to every 4 quarts of fruit. If the fruit is not juicy, add water to nearly cover the fruit.

3. Cover the kettle and cook slowly, stirring occasionally. When it simmers, crush the fruit with a potato masher. Cook thoroughly until the juices run freely.

4. Dip the jelly bag into boiling water to sterilize it and wring out quite dry. Suspend the jelly bag on a pole over a bowl or jar, pour in the hot fruit, and let drain until all the juice is well extracted. This time varies from 12 to 20 hours. Do not squeeze the bag, for squeezing forces out pulp and makes the jelly cloudy.

5. When well drained, return the pulp to the preserving kettle, cover with water, stir until well mixed, cover and bring slowly to a boil as before; then drain again into another jar. By testing the juice with alcohol the amount of pectin present may be ascertained.

6. A second and third extraction of juice is possible from such fruits as crab apple, currants, quinces, and grapes.

7. Put the pulp again in the preserving kettle, cover with water, heat gradually, and simmer quietly for about 30 minutes. Put in a jelly bag and drip again.

8. Jelly made from the second extraction will be of as good flavor and color as the first. The third extraction contains pectin and acid enough for jelly, but lacks some flavor. This juice is good to combine with other fruits rich in flavor but lacking in pectin.

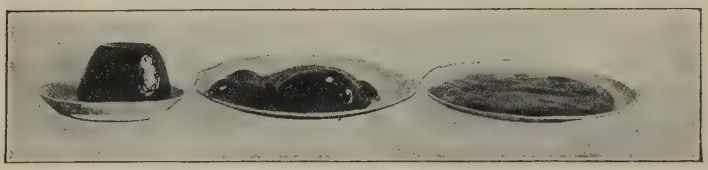
Do not mix the juice from the first extraction or cooking with that of the second or third.

The Proportion of Fruit Juice and Sugar.—Most failures in making jelly are due to the use of too much sugar. A correct proportion of sugar to juice is necessary. Not enough sugar makes a tough jelly, and too much produces a soft jelly and may form crystals.

For most juices rich in pectin and acid use:—

¾ c. sugar to 1 c. fruit juice.

For cranberry, sour and crab apples use ½ to ¾ c. sugar to 1 c. of fruit juice.



Showing the effects of different proportions of sugar and juice. Jelly to left contains half as much sugar as juice. Jelly in center contains equal proportions. Jelly on right contains twice as much sugar as juice. The jelly at the left was ideal in texture, color, and taste.—*Courtesy Home Economics Department, University of Illinois.*

If fruits contain a large amount of water and the pectin test shows a small amount of pectin, boil the juice down before adding the sugar or use less sugar.

For the second and third extractions, which contain more water than the first, the juice should be boiled down quickly until the pectin test shows up clear, when the usual proportion of sugar may be used.

A large quantity of jelly should not be attempted at one time. From eight to twelve glasses may be made with good results. It is difficult to care properly and promptly for a larger quantity.

Making the Jelly.—Measure out the sugar into a granite pan and put into the oven to heat. Leave the oven door open and stir the sugar occasionally to prevent burning.

Cold sugar added to hot juice delays the boiling.

Pour the fruit juice into the preserving kettle and bring to a boil. Too long boiling destroys the gelatinizing power of the pectin and may also cause crystals of sugar to form in the jelly after it stands. The time necessary for boiling varies with the proportion of sugar and pectin in the juice. Where much sugar is used, less time is taken, and thin juice deficient in pectin requires longer cooking.

Remove carefully all the scum that rises to the top of the boiling juice and from around the edges of the kettle.

After the juice has boiled 10 to 12 minutes and has been reduced to about $\frac{4}{5}$ its original volume, add the hot sugar slowly, stir occasionally to prevent burning, and continue the boiling until the test shows sufficient cooking to jelly.

Tests for Jelly.—Use either spoon or thermometer test.

1. *Spoon Test.*—Five minutes after the hot sugar is added to the concentrated juice draw it back from the heat and test it. If the mixture jellies or thickens and drops off the spoon in one heavy drop, it has been cooked enough.

2. *Theremometer Test.*—This is a more accurate test. Insert a thermometer in boiling sirup. Fruit juices jelly at a temperature of 210° to 218° F. Test quickly, since the jelly may be overcooked, if there is too much delay.

Filling Glasses.—Sterilize jelly glasses in the same manner as fruit jars, and, when the jelly is ready, set the glasses in a pan containing a little hot water, to keep them from breaking when the hot jelly is poured in. With a sterilized cup or pitcher fill each glass to within a half inch of the top.

Let the jelly stand in a sunny place several hours to set. Then, to exclude molds, cover with hot paraffin, and cover the glass with a clean, tight-fitting metal cover or a heavy paper tied securely over the top.

Melt the paraffin on a low fire or over hot water.

Wipe the glasses with a damp cloth, label with name and date, and set in a cool, dry place.

Causes of Poor Jelly.—Failure is due to one or more of a number of causes, which must be discovered by tests.

The following are the important causes:—

1. Too little pectin or not enough acid.
2. Too much or too little sugar may have been used. The error is usually on the side of too much.
3. Too long or insufficient boiling.

Sealing Fruit Juice without Sugar.—When more fruit juice is extracted than is desired to make into jelly at the time, it may be canned and stored for a year or two, if desired. Cook it by the open-kettle or cold-pack method.

Open kettle: Heat to boiling point, then seal in sterlized fruit jars.

Cold pack: Put in jars and process 20 minutes in water-bath outfit. Seal and store.

JAMS, MARMALADES, BUTTERS, AND CONSERVES

The pulp which remains after making a fruit extraction of juice for jelly, if not used for other extractions of juice, may be utilized in making jams, butters, or conserves.

Jam and fruit butter are similar products.

Jam is a cooked mixture of berries and small fruits with sugar.

Fruit butter is the term applied to cooked mixtures of larger fruits with sugar.

Marmalade is the term used for the same kind of products when oranges or grapefruit are used.

Jams and marmalade are made from the whole fruit (pulp and juice) cooked thick with from ¾ to its whole weight of sugar.

A conserve is made from a mixture of fruits with or without the addition of some other material, such as nuts and raisins. Fruits most used are strawberries, raspberries, blackberries, rhubarb, grapes, oranges, peaches, and quince or big plums.

General Method of Preparing Fruit Pulp Mixtures.—

1. Pick over the fruit, wash, and weigh. Cut large fruit into quarters or smaller pieces and crush the berries and grapes. Put in a perserving kettle with enough water to keep from burning,—about ¼ cupful to each quart of fruit. Cook slowly until the fruit is soft and the juices run.

2. Remove the seeds from grapes and some berries by rubbing the mixture through a sieve, then return to the fire and add an equal weight of hot sugar slowly. Stir the mixture constantly to prevent burning, and cook until it gives the jelly test.

3. Turn into hot sterilized glasses, let stand a day or two, and then seal and store the same as jelly.

QUESTIONS AND PROBLEMS

1. What fruits in your market may be used for making jelly?
2. What are two acid fruits which require the addition of pectin in order to make jelly?
3. Why is the sugar heated before adding it to the boiling juice in making jelly?
4. Why is jelly put in glasses instead of fruit jars?
5. What makes the difference in the kind of seal?
6. Why is it unwise to make a large quantity of jelly at one time?
7. How would you sterilize jelly glasses?
8. Name two reasons for canning fruit juice for jelly-making without adding sugar.
9. Why is apple juice so often used as a base in jelly-making with other fruits?
10. How can you tell when jelly is done?

APPLICATION

1. Currant Jelly

Method.—Pick over the currants, but do not remove the stems; wash and drain. Mash a few in the bottom of a preserving kettle, using a potato-masher. Add more currants and mash and continue adding currants until all are used. Bring to a boil slowly and let simmer until the currants appear white. Strain through a coarse strainer and allow the juice to drain through a jelly bag.

Make a second and third extraction of juice also. Measure the juice, bring to the boiling point, and boil 5 minutes.

Add ¾ as much heated sugar as juice and boil until a good jelly test is obtained; then pour into glasses.

(*Basis for* 1 *girl*, 1 *c. juice.*)

2. Apple Jelly

Method.—Wash the apples and remove the stems and the dark spots. Cut into fourths, but do not core or pare. Add just enough water to cover the applies and cook until the fruit is soft and crushed. Drain through a jelly bag. The pulp that remains may be put through a colander with more fruit for flavoring and used for jams. For the jelly, measure the juice, put in a preserving kettle, and boil 10 to 15 minutes for a small quantity or 20 minutes for a large quantity. Remove the scum and add ¾ as much heated sugar as apple juice. Continue the boiling for 5 minutes or until the jelly test shows the mixture will jelly. Pour into hot sterilized glasses and seal when cold.

(*Basis for each girl*, 1 *c. juice.*)

VARIATIONS OF APPLE JELLY

Mint Jelly. Pour 1 c. boiling water over 1 c. mint leaves. Let steep 1 hour. Press out the juice and use 2 tbsp. of this juice with ¾ c. sugar to each 1 c. of apple juice.

Geranium Jelly. Place a well washed and dried geranium leaf in the bottom of a jelly glass. Fill glass with apple jelly. Remove the leaf when serving the jelly.

Use equal parts of:—

Apple with pear.
Apple with quince.
Apple with strawberry.
Apple with raspberry.
Apple with rhubarb.
Apple with cherry.
Apple with peach.
Apple with pineapple.
Apple with strawberry and quince.
Apple with plum.
Apple with elderberry.

3. Rhubarb Conserve

3 lbs. rhubarb
3 oranges
½ lb. shelled pecans
1 lb. raisins
3 lbs. sugar

Method.—Wash raisins, and scald nuts. Peel the oranges. Put the rinds through a food chopper. Slice the pulp of orange. Cut the rhubarb in half-inch pieces. Mix altogether, cooking over a slow fire 45 minutes. Test as for jelly. Pour in glasses and seal like jelly.

4. Orange Marmalade

9 oranges
6 lemons
4 qts. water
Same weight of sugar as fruit

Method.—Slice as thin as possible the oranges and the lemons cross-

wise with a sharp knife; remove the seeds and put fruit into a preserving kettle with the water. Cover and let stand for 36 hours and then boil for 2 hours. Measure the cooked fruit and add an equal quantity of sugar. Cook until the mixture jellies. Jar, and seal when cold.

5. Big Plum Conserve

1 basket big plums — 3 oranges, rind of one
Sugar, ⅔ weight of plums — ¾ lb. shredded almonds

Method.—Cut the plums into halves and remove the stones. Cook the plums, oranges, and the sugar for 45 minutes. Blanch the almonds and cut them several times lengthwise. Add the almonds to the fruit mixture and cook 10 minutes longer. Put into sterilized glasses and seal when cold like jelly. This quantity makes 13 glasses.

6. Spiced Grapes

7 lbs. fruit — 3½ lbs. sugar
1 c. strong vinegar — 2 oz. cinnamon
1 c. grape juice — 1 oz. cloves

Method.—Press pulp out of grapes. Boil the pulp until tender and then pass it through a colander to remove the seeds. Mix the skins with the pulp. Boil all until thick like marmalade. When done, turn into glasses and seal. Good to serve with meats.

7. Strawberry Jam

4 c. strawberries — 5 c. sugar
½ c. lemon juice

Method.—Wash and hull berries. Cover with sugar and let stand over night. In the morning bring to boil and boil exactly 7 minutes. Add the lemon juice and boil 3 minutes longer. Pour into sterilized glasses at once. When cold, seal as jelly. A larger quantity can not be made at one time on account of the time allowed for boiling.

HOME PROJECTS

1. Make one kind of jelly at home.
2. Keep jelly records for the season as in canning records.

LESSON 37

PRESERVATION OF FOOD

Seasoning—Preserving

There are certain substances, or food adjuncts, used extensively in the dietary which have no nutritive value and can not be classed as foods, but which serve to give variety to the flavor of foods, stimulate the dulled appetite, and encourage the flow of digestive juices. These food adjuncts include condiments, spices, and flavoring extracts.

Other substances which are not used for nutritive value, such as salt, vinegar, and spices, tend to preserve foods and often also give a desirable flavor.

SEASONING

Condiments are for the most part aromatic fruits, seeds, or leaves that have a high flavor due to volatile oils. These oils lose their strength during cooking. The condiments of salt, vinegar, mustard, horse-radish, pepper (black, white, cayenne), mint, thyme, sage, dill, capers, chives, garlic, and parsley are those usually added to meats and soups.

Spices are condimental in nature and are used to season foods, especially those containing sugar. Common spices are ginger, cinnamon, nutmeg, mace, cloves, allspice, caraway, pepper, peppermint, and angelica. They are used whole, ground, or in the extract.

It is much better for young persons, as well as for older ones, if they eat sparingly of highly-seasoned food. The continued use of condiments creates a habit for them and leaves no relish for natural flavors, which are more delicate and more satisfying.

Spices should never be used on the food of babies or very young children, because they irritate the mucous membrane of the food tract and natural flavors are all that is necessary for their healthy appetites.

Before the pure food laws were effective ground spices were generally adulterated. The addition of ground hulls, starch, flour, and mineral matter was common.

Allspice is obtained from berries of an evergreen tree in the West Indies, belonging to the same specie as cloves.

Cinnamon is obtained from the dried inner bark of a tree. Ground cinnamon is a powder consisting of a mixture of cinnamon and cassia.

Cloves are the dried flower buds of an evergreen tree, bearing its name. They are natives of Brazil, Ceylon, India, and West Indies.

Ginger is a product made by drying, bleaching, and treating the root of a plant, a native of India and China. It contains a large starch content, and much volatile oil.

Nutmeg is the dried seed of a tree grown in the Malay Archipelago, similar in appearance to the orange tree.

Mace is the outer husk which surrounds the nutmeg seed. Its volatile oil resembles nutmeg.

Caraway is the seed of a plant grown in North and Central Europe and Asia.

Mustard is a powder made from the mustard seed. Prepared mustard is a paste mixture made of ground mustard seed with salt, spices, and vinegar.

Black pepper is obtained from the immature berry of a climbing plant cultivated in tropical countries.

White pepper is obtained from the ripened berries of the same plant and contains more starch than black pepper.

Cayenne pepper is prepared from the dried, ripe, whole fruit of the Capsicum plant.

Paprika is prepared from a dried ripe fruit excluding seeds and stems of the Capsicum plant. It is sweet and mild.

Mint, thyme, sage, dill, bay leaf, and marjoram are leaves and tips of blooming herbs used to add seasonings to food.

Salt is, in a sense, a food, since a certain quantity is

needed in the gastric juice. In the quantity in which it is commonly eaten, however, it is a condiment.

Vinegar is a condiment when used for flavor. It is dilute acetic acid, made by fermenting weak alcoholic solutions like hard cider, wine, and malt. Cider vinegar has an agreeable flavor and is the best for most cooking purposes.

Flavoring extracts are liquid products derived from parts of aromatic plants by treating with ethyl alcohol to extract the volatile oil, and are used to add flavor to food mixtures. Because volatile oils evaporate quickly and are completely lost when heated, flavoring extracts should be added only to cold or cool food mixtures. Extracts of almond, vanilla, lemon, peppermint, wintergreen, and rose are some of the most commonly used flavors.

PRESERVING

Preservatives.—Foods are subject to decay on account of the action of microscopic organisms called yeasts, molds, and bacteria. Whatever, therefore, prevents their growth is called a preservative. Foods that are to be kept must, then, be saturated with some harmless substance of this nature.

Salt. Since salt prevents the action of bacteria, it is used in preserving many foods such as vegetables and meat. A brine made of salt and water is used to cover the food and exclude the air. The density of the brine may vary according to the kind of product desired.

Proportion of water and salt for brines:—

Brines	Salt	Water
10%	1⅔ c.	1 gallon
15%	2⅔ c.	1 gallon
25%	4½ c.	1 gallon

A 10% solution is required to prevent fermentation. When a brine of 15% to 25% is used, the salted food must be soaked for some time before cooking, in order to freshen

it. Vegetables which are made up largely of water require a stronger brine than those containing little water.

Sauerkraut is made by using a brine less than 10%. The kraut flavor is due to active fermentation of the cabbage in the salt solution.

Vegetables which may be salted include corn, tomatoes, string beans, cabbage, cauliflower, and Swiss chard. Vegetables must be perfectly fresh and are best just before they are fully matured.

General Method of Preserving Vegetables.—Pick over, wash thoroughly, remove bruised portions, and weigh the vegetables. Pack while crisp and tender in a clean container. Any sound wooden keg or earthenware jar makes a good container. Weigh out the salt to be used. Use ¼ as much salt by weight as vegetables. Put in a layer of vegetables about 1 inch deep. Cover with a thin layer of salt, add another 1 inch of vegetables, and again cover with salt. Continue until all the vegetables are used. Cover the top with a layer of grape leaves, horse-radish leaves or Swiss chard. Turn a large plate over the top. Let stand a day or two. If sufficient liquor to cover the vegetables has not been extracted by the second day, add a 10% brine to cover the surplus. The plate should be weighed sufficiently to hold the vegetables under the salt solution. A week or two later, after all bubbling has ceased a good vegetable oil or melted paraffin may be poured over the surface of the brine deep enough to form an air-tight seal and prevent the growth of mold and the evaporation of the liquid. Store in a cool place.

To Use: Remove the top layer and discard it, if it is discolored. Freshen the vegetable by soaking in clear water and use as any fresh vegetable, either uncooked in salad or for cooking.

Vinegar, spices, and sugar are preservatives. Sometimes all three are used in combination.

Pickling is preserving in vinegar or brine. Salt or vinegar with spices and herbs give flavor and at the same time are preservative.

Kinds of Pickles.—There are many varieties of pickles, but in the main they may be classed as sweet, sour, dill, or a combination of sweet and sour. Pickles are generally made of cucumbers, green tomatoes, watermelon rind, apples, crab apples, peaches, and pears.

General Rules for Pickling Fruits and Vegetables.—

1. Never use brass, copper, or tin utensils in preserving pickles.

2. Clean the pickles thoroughly by washing in several waters, remove all stem ends, and sort according to size.

3. A small portion of alum improves cucumber pickles, but too much is injurious.

4. Do not boil the vinegar too long,—not over 10 to 15 minutes—for it loses its strength.

5. Keep the pickles covered with vinegar in good, clean glass or stone jars. A few pieces of horse-radish added prevent scum from forming on the surface of the vinegar.

6. Cucumbers soaked in a brine overnight before pickling, are firmer, have more of the salt taste, and will keep better. A brine made of about ½ cupful of salt to a quart of water is the proportion most commonly used.

7. Use only the purest spices and the best cider vinegar. Whole spices are better to use than ground spices. If ground spices are used, tie them in a small muslin bag.

Drying (see page 266) and **low temperature** (page 242) are other means of preserving food.

QUESTIONS AND PROBLEMS

1. Why is it a bad habit to salt food very highly?
2. Why is pepper bad for children?
3. Is there any resemblance in the substance in tea and coffee to those in condiments and flavoring extracts?

4. What effect would the use of cloves have upon the body, if used in great quantities?

5. Why would the habit of eating cloves be very harmful?

6. Are pickles easy or difficult to digest?

7. What is brine used for?

8. Why are grape leaves or horse-radish leaves used to cover pickle brine?

9. Why are salted vegetables soaked in clear water before cooking?

10. What is the difference between pickled vinegar for vegetables and fruits?

APPLICATION

1. Sweet Pickle for Fruits

2¼ c. brown sugar
1 c. vinegar (medium sour)
1 tsp. whole cloves
¼ oz. cinnamon

Method.—Cook the sugar, vinegar, and spices together for about 15 to 20 minutes. Put in the fruit and cook until it begins to get tender. Remove from the fire and put into a large jar. The next day pour off the vinegar, reheat it, and pour again over the fruit. Do so several successive days until the fruit is tender. Weight down a plate on top of the pickles to hold them under the vinegar.

2. Sweet Pickle for Vegetables

2 lbs. sugar to 2 qts. of vinegar (medium sour)
2 tbsp. of cinnamon or stick cinnamon
2 tbsp. of cloves
½ lb. mustard seed
2 tbsp. ginger or allspice
½ tbsp. red pepper

Method.—Cook pickle ingredients together until somewhat boiled down, and pour over the vegetables. Reheat the pickle 3 or 4 successive mornings and return to the vegetables.

3. Salted Ripe Tomatoes

Select medium-sized tomatoes free from bruises. Pack in a 10% brine. For every gallon of water replace ¾ c. water with ¾ c. of cider vinegar.

To use for cooking, remove from brine and soak in clear water for 30 minutes. To use in salad rinse off the brine, but do not soak. The color and flavor should be just as good as fresh tomatoes.

4. Salted Green Tomatoes

Salt the same as ripe tomatoes.

To use, soak in clear water 2 hours. Use for salads, tartar sauce, and for sandwich fillings.

5. Salted Cauliflower

Separate head into parts. Pack in 10% salt solution as for ripe tomatoes.

To use for salads it needs no soaking. For cooking, rinse well and cook the same as fresh cauliflower.

6. Cucumber Pickles

1 gal. vinegar
1 c. sugar
1 c. salt
1 c. mustard
4 qts. small cucumbers

Method.—Mix salt, sugar, and mustard together; then add the vinegar slowly, stirring well. Wash and look over the cucumbers, and put into a stone jar. Pour on the pickle brine, let stand weighted down with a plate to keep pickles under the brine. These pickles are ready for use in a week's time. The brine is *not* heated.

7. Sweet Pickles—Peach

½ peck peaches
1 pt. vinegar
2 lbs. brown sugar
1 oz. stick cinnamon

Method.—Make a pickle of sugar, vinegar, and cinnamon. Scald the peaches or remove the wool by rubbing with a towel. Do not stick cloves into them. If very ripe, pour the hot sirup over them on 3 successive mornings. If hard, cook a few minutes in the hot pickle; then pour on the hot pickle on 2 successive days.

8. Watermelon Pickles

Method.—Cut the pared rind in thick slices. Boil rinds in boiling water until nearly tender. Remove rinds into hot sweet pickle. Let stand over night. Reheat the pickle vinegar and pour over pickles on 2 successive mornings. Keep in stone jars.

9. Bordeaux Sauce

1 qt. chopped green tomatoes
2 qts. sliced cabbage
3 onions
1 red pepper
1 qt. vinegar
½ tsp. allspice
¾ tbsp. mustard seed
1 c. brown sugar
2 tbsp. salt

Method.—Mix all the ingredients together and boil for 25 minutes. Seal in small jars and use with meats as a relish.

HOME PROJECTS

1. Prepare pickles at home or help mother make pickles.
2. What kinds of spices are in your home cupboard?
3. Find out the difference between cider and tarragon vinegar.
4. How is vinegar made?

LESSON 38

MARKETING

Meal-planning, to be efficient and economical, must be based upon systematic, intelligent marketing.

Simply going to market and buying what one wants to eat is not marketing in its true sense.

Intelligent marketing means:—

1. Having a definite sum to spend for food, and knowing just what part of each dollar is to be used for different items of food.

2. Buying foods for their nutritive value instead of for preference or price.

3. Knowing the sanitary standards set by state laws for the manufacture and distribution of food products.

4. Being familiar with the pure food requirements regarding adulterations and preservatives.

5. Checking the weight and measure of foods as purchased, when they are delivered.

6. Knowing how to identify manufactured products by trade names, brands, labels, size of can, bulk, etc.

7. Knowing how to substitute in the meal plan a food of real value at a much less cost for fancy unseasonable foods of great cost.

8. In fact, being ever alert and ready to learn all there is to know of food and the many factors governing its quality, sale, and distribution.

Proportionate Division of One Dollar.—There must be some plan of expenditure in every home, if the bills are to be kept in their proper place, and there should be a definite sum set aside for food.

Many estimates have been made as to the best proportion of expenditures in the home. This depends greatly on the income and the standard of living. For the small income,

when the actual living costs consume the greater part of the salary, the proportion spent for food will be greater than in the case of a large income, even though the plane of living is considerably more elaborate.

It seems almost impossible to give a standard which is adaptable to all classes. Only by working with individual incomes and conditions can definite figures be reached. Some budget system, however, is almost necessary for all classes.

We can, however, estimate very closely how each dollar spent for food should be distributed. It is agreed by most persons in authority that the division of the dollar into five equal parts is the best proportion to make.

Use the first 20¢ (more or less) for vegetables and fruits.

Use the second 20¢ (more or less) for milk and cheese.

Use the third 20¢ (more or less) for meats, eggs, fish.

Use the fourth 20¢ (or more) for cereals, bread, macaroni, and rice.

Use the fifth 20¢ (or less) for sugar, fats, beverages, flavorings.

This little rule is more or less elastic, as will be noted from the table. If more than the allotted 20¢ is spent one week on vegetables or cereals, for example, some other item will need to be cut down below the 20¢ allowance. Meat, fish, and eggs may be displaced by foods such as cereals, milk, and legumes to cut down the cost and yet serve the body in the same way. Sugars and fats are not as necessary in the diet as some other types of food, and need not have a 20¢ expenditure all the time.

Another way of estimating the expenditures for food is:—

1. Spend ¼ to ⅓ of each dollar for bread, cereals, rice, macaroni.

2. Buy ⅓ to ½ quart of milk a day for each member of the family.

3. Spend as much each day for vegetables and fruits as for milk.

4. Never spend more for meat and eggs than for vegetables and fruits. Decrease the amount spent for meat as you increase the amount spent for milk.

Food	Allow.	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total
Vegetables and fruits.	.20	.....	.18—	.....	.....	.....	.....	.....	.....
Milk and cheese.....	.20	.....	.17—	.....	.....	.....	.....	.....	.....
Meat, eggs, fish.....	.20	.....	.31+	.....	.....	.....	.....	.....	.....
Cereals and products	.20	.....	.16—	.....	.....	.....	.....	.....	.....
Sugar, fat, bev. flav..	.20	.....	.18—	.....	.....	.....	.....	.....	.....
Daily totals.....	1.00	.....	1.00	.....	.....	.....	.....	.....	.....

If a housekeeper spent on Monday 24c. for milk, 43c, for meat, 20c. for cereals, 25c. for sugar, and 25c. for vegetables or fruit ($1.37 in all), these amounts should be reduced to proportions of one dollar. Milk would be 24/137 of 1.00=17c.; meat would be 43/137 of 1.00=31c.; and so on for the other items. Plus and minus signs after the proportionate costs would indicate whether one were exceeding or underspending one's allowance. Adjust fractions to make one dollar even.

By keeping an account of the week's supply of food as purchased it is easier to check the total spent for different items than it is to check for only one day. Some system should be devised to keep this account in the most simple way without adding greatly to the work of the home-maker. If the system is too elaborate, it invariably becomes a burden and is soon disregarded, and the old hit and miss system of buying and spending follows.

Nutritive value must be considered in buying food—not price nor personal taste, as a much more certain way of getting the most nutriment for one's money, since prices change much according to economic conditions and are not always based on food values. The difference in value in two products may be worth considerable more than the few cents difference in price. The consumer must judge for herself the real value of foods before making her purchases. Caution should be exercised in purchasing goods offered at bargains, as they may be old or inferior.

Packing Foods.—*Canned foods* are packed in different sizes of standard cans which are supposed to contain corresponding weights. The weights of different products varies, however, so that a can of one food product may weigh more or less than the same size can of another product.

The weight is always printed plainly on the label together with the name of the packer or the jobber distributing the product, and all other necessary information as to the nature of the contents. If the food contains adulterations or preservatives, it must be so stated.

The size of the different standard cans includes No. 1, quarter; No. 1, half; No. 1, short; No. 1, tall (sometimes called 1½); No. 2, No. 2¼, No. 3 (regular); No. 3, tall; and No. 10. No. 2 and No. 3 are perhaps used more commonly than other sizes, although certain products are always canned in the same standard-size can. The No. 10 cans are extra large for use only in hotels and places requiring large quantities. The number does not appear on the can, but is determined by the weight of the contents and shape of can. All dealers order their stock by numbers, and the consumer should also always order canned goods by number. In ordering a can of corn order a No. 2 can and state the name of the brand desired, or order a No. 3 can of tomatoes with name of brand. Never buy canned goods by saying, "A can of corn or a 20¢ can of corn or a 25¢ can of tomatoes."

It will be noted from the above table that many of the same products are canned in several different-sized cans. Corn may be purchased in a No. 1½ or a No. 2 can. Pineapple may be purchased in Nos. 2—2¼—3 regular or 3 tall can. The thickness of the slices and the number of the slices in a can vary so much that only when ordering by number and brand name can one be sure of getting the quantity and quality of pineapple desired.

Glass or stone jars are often used for packing fruits, vegetables, olives, pickles, catsup, oils, butters, jams and other foods. Goods packed in this way present a very attractive appearance. The character of the contents can be readily seen, and choice goods are, therefore, more necessary in such a pack. The price, however, is likely to be higher than the intrinsic value.

The following table gives the size, number of cans, with corresponding average weight, and also the type of foods packed in each size can:

Standard size can	*Weight of contents*	*Foods packed*
No. ¼	4-4¼ oz.	Sardines, potted meats, condensed milk.
No. ½	7¾-8 oz.	Lobster, shrimp, chicken, potted meats, salmon (flat), condensed milk.
No. 1 short	10 oz.	Boned meats, canned soups, condensed milk.
No. 1 tall, or 1½	16 oz.	Peas, corn, sliced peaches, salmon (tall), berries.
No. 2	1 lb. 4 oz.	Corn, beans soups, small fruits, grated or sliced large fruits.
No. 2½ (4)	1 lb. 14 oz.	Largefruits, vegetables, sirup, baked beans.
No. 3 regular	2 lbs. 1 oz.	Peaches, pineapples (10 slices) whole tomatoes, spinach, soup.
No. 3 tall 5½ in. high	2 lbs. 6 oz.	Large fruits, whole tomatoes, baked beans, pineapples.
No. 10 (extra large)	6 lbs. 6 oz.	Large quantities of various packs for large consumers.

Paper packages are commonly used to include dry foods, such as cereal products, raisins, and other dried fruits, crackers, wafers, macaroni, and others. These packages are light and sanitary as well as convenient receptacles for keeping the food.

Grading Foods.—Canned products are generally packed in three different grades. Each grade stands for a definite quality. The three grades are (1) standard, (2) extra standard, (3) fancy.

The standard grade is the lowest quality. The foods are not graded as to size or shape and usually contain a larger percentage of liquids. They sell for much less and are the cheapest to use for cooking purposes.

The extra standard grade is the best and most universal for table use. Foods are more uniformly graded and solidly packed without as much liquid.

The fancy grade is the finest. The foods are selected with greatest care as to size and shape. Very small peas and choice fruits are packed as fancy grades. These do not contain more food value, but command a much higher price, and are not practical for every-day use. They should be served only for special occasions. The brand indicates the grade of the product, and the consumer should remember when ordering, what quality of product a brand signifies.

Package goods are more likely to be of one uniform grade.

Brands of Foods.—Trade-marked brands of foods are guaranteed to be of permanent quality and the firm's name of the packer is always given on the container for a product. This tells the consumer he is willing to stand back of his product and make good any defects.

Foods bearing private brands are labeled only with the name of the firm or jobber for whom they were packed, and the label does not say by whom or where they were made. Any number of small plants or factories may pack the product for the jobber, and send it to him for labeling. Some persons think that for this reason there is not the uniformity in quality as in the trade-marked brands. There may not be the same quality in a few cases, but almost every reliable jobber or firm contracting with small factories for their products makes sure of the quality by having one plant produce one grade and another plant produce another grade. The consumer may be assured of as uniform a quality with goods bearing the label of a private brand put out by a reliable firm as she is of the uniformity of any advertised trade-

marked foods. The firm that puts its name on a label in any case is the responsible party and is the one to make the guarantee.

Labels on Foods.—The best protection for the consumer against buying inferior goods lies in her ability to read labels as they really are, and not as they appear to be.

Read the name of the brand and know what grade of product that brand stands for and where it is made. Note the weight of the can, and all other information on the can. Many labels while declaring the contents of the can according to law, are so worded as to give the wrong impression as to the quality of the goods, and it is only the keen observer who would detect an evasive description.

Buying in Quantity.—What would be practical for one family to buy might not be wise buying on the part of another family. The family needs and number in the family must determine the size and quantity of all goods to buy.

When staples of flour, cereals, sugar, etc., are used in considerable quantity by a family within a reasonable time, then it is wise to buy in bulk such supplies that are perfectly clean, and so reduce the cost of food.

When the family is small, it is extravagant to buy more at one time than can be properly stored and consumed while food products are in perfect condition. For small family buying it is wisest to buy package goods by brands that are known to be good and reliable.

While the small can of a certain product may cost only 15¢ and a large can of the same kind cost 20¢ or 25¢, it is generally economy to purchase the large can, and plan to utilize it for two meals, if need be, rather than to purchase two of the small cans, and use one for a meal. The manner of serving may be so changed as to give variety even with the same food.

It is economy to order canned foods by dozen or case lots in the fall when the new pack of canned products is available.

Several dollars on a winter's supply is saved by this kind of buying. If a case of one kind of food is more than will be used in the winter, the grocer will mix a case of the same size cans, giving you a choice of other foods to fill the case.

Bulk goods bear no trade mark or means of identifying them, and the consumer has no way of protecting herself against inferior goods when buying them. Package goods bearing trade marks are identified and the consumer knows when buying these who the manufacturer is and where the goods are packed. Then, if the goods are inferior in quality or are damaged in the course of distribution, the consumer is protected to the extent that the firm back of the goods will rectify all justifiable complaints.

Suggestions for marketing may be summed up as follows:

1. The woman, to manage her home successfully, should have a definite income or allowance and know how much of that should be spent for food.

2. Order or purchasing lists should be made at home before going to market. Daily marketing is not necessary. By making out menus for two or three days in advance, supplies may be ordered for those meals on one marketing trip, and so save time for the homemaker and extra deliveries for merchant. A marketing list should be kept in the kitchen, on which should be noted the items that are getting low. Supplies should be ordered before one is out of any article.

3. Check purchasing lists with delivered groceries to see whether order is filled correctly. Check items as to cost of foods and total items.

4. Marketing should be done as early in the day as possible so that supplies may be selected when fresh and while there is the best selection and also to allow time for delivery early in the morning. Supplies may then be taken care of and stored before luncheon.

5. Foods which need considerable time for preparation are best purchased the day before they are to be used, so

that the necessary preparation may be done early in the morning of the day they are to be served. It is poor planning which necessitates much afternoon food preparation and cooking even with the dinner served at night.

6. One should go to market and make one's own selections instead of ordering by telephone.

7. One should patronize only reliable merchants who give first-class service. Weigh and inspect goods and read labels to see that proper value is obtained for the money spent.

8. Patronize only markets that are perfectly sanitary and where the dress and habits of the clerks are neat.

9. Staples should be bought in quantity, if possible, and ordered, therefore, less frequently. Perishable foods should be purchased in small quantities every day or two.

10. It shows a lack of planning to expect or ask more than one delivery a day. Emergency supplies on hand will take care of unexpected company demands.

11. Clerks and delivery boys should not be asked for too much special service.

12. Goods should be bought in season when prices are right and low. Goods out of season are always high, on account of transportation and hothouse conditions. High prices do not signify quality.

13. Cheap food below prevailing market prices is either damaged or of inferior grade. Everything should be examined before buying.

14. The price of goods should be known before buying.

15. The housekeeper should learn to substitute one food for another of like composition and character in order to secure equal results in the menu for least money.

16. Canned goods should be bought by size number of can and by trade name, never by price of can. Every wholesaler has special brand names. Test and compare grades as to weight, quality and price, then order in dozen or case lots, if possible, the brands found to be the best.

MARKET CHART

Food	Quantity	Cost per weight or measure				
		Lb.	Qt.	Doz.	Cup	Tbsp.
Cereals						
Rolled oats	Pkg., lb.					
Cream of wheat	Pkg., lb.					
Prepared foods	Pkg.					
Fats						
Butter	Lb. (1-3 lb. lots)					
Butter substitutes	Lb. (1-3 lb. lots)					
Lard	Lb. (1-3 lb. lots)					
Suet	Lb.					
Vegetable oil	Qt., gal.					
Flour (wheat)	24½ lbs., 49 lbs.					
Corn-meal	5-10 lbs.					
Graham	5-10 lbs.					
Rye	5-10 lbs.					
Whole wheat	5-10 lbs.					
Nuts						
Almonds	Lb.					
Peanuts	Lb.					
Pecans	Lb.					
Walnuts	Lb.					
Sirups						
Corn oil	Qt., gal.					
Maple	Qt., gal.					
Molasses	Qt., gal.					
Sugar						
Brown	5-10 lbs.					
Granulated	10-25-100 lbs.					
Powdered	2-5 lbs.					
Miscellaneous						
Bacon	Lb.					
Baking powder	Lb.					
Cheese	Lb.					
Chocolate	Lb.					
Citron	Lb.					
Cocoa	Lb.					
Cocoanut	Pkg., can					
Coffee	1-3 lbs.					
Cornstarch	Lb.					
Crackers	Lb., pkg.					
Cream	½ pt., pt., qt.					
Dates	Lb.					
Eggs	Doz., case					
Gelatin	Pkg. (1-3)					
Jelly	Glass, doz.					
Macaroni	Lb.					
Meats	Lb., quarter					
Rice	Lb.					
Soda	Box					
Spice (ground)	Box					
Spice (whole)	Oz.					
Tapioca	Lb., pkg.					
Tea	Lb.					
Vanilla	Pt.					
Yeast						
Compressed	Cake					
Foam	Pkg.					

FRESH FOODS

Fruits

Kind	Quantity	Cost	Kind	Quantity	Cost
Apples	Pkg., case		Oranges	Doz., case	
Bananas	Lb.		Peaches	Doz., case	
Blueberries	Qt.		Pears	Lb.	
Grapefruit	Piece		Raspberries	Box	
Lemons	Doz.		Strawberries	Box	

Vegetables

Kind	Quantity	Cost	Kind	Quantity	Cost
Asparagus	Bunch		Onions	Bunch, lb.	
Cabbage	Head		Parsley	Bunch	
Carrots	Bunch		Potatoes	Lb., bushel	
Celery	Bunch		Spinach	Bunch	
Lettuce	Head, stalk		Turnips	Lb., bushel	

CANNED FOODS

Fruits

Kind	Quantity	Brand	Size	Cost		
				Case	Doz.	Can
Apples						
Berries						
Cherries						
Grapes						
Peaches						
Plums						

Vegetables

Kind	Quantity	Brand	Size	Cost		
				Case	Doz.	Can
Beans						
Corn						
Peas						
Tomatoes						

17. Examine all cans, and if there is any bulging of the can report it at once to grocer and have him call for the can.

18. If canned goods have damaged or faded labels, be careful. The products may be old and of inferior quality. Always buy fresh canned goods, even if the price is a few cents higher.

19. Fancy and extra fancy brands all command fancy prices without giving any higher food value. They should not be ordered unless one can afford to buy them and only then for especial occasions.

20. Package goods command higher prices than bulk foods. Labels and containers add to cost. Where large quantities are used, purchasing in bulk is best, if quantity will be used before food deteriorates by long storing. If small quantity is used, package goods oftentimes are best; they are cleaner, and sanitary methods of handling make them worth an extra price.

21. Buying in quantity more food of any kind than will be used during a season is extravagant. Foods lose considerable value in long storing and a fresh stock of food is safer.

Emergency Shelf.—Make out a list of supplies which would be wise to have on hand in emergency, when unexpected guests arrive. Order these and place them on one shelf by themselves and call this shelf the "emergency shelf." As foods are used from this shelf make a note on the purchase sheets and order others to take their place. Keep the shelf equipped at all times. The cost is no more in the end, much worry and time are saved, and the efficiency of home-making is increased.

MARKETING SCORE CARD

A simple score card for markets something like the following might be used to ascertain the best marketing place:—

1.	General appearance		10%
2.	Type of goods handled		
	a. Quality	10%	
	b. Variety	10%	20%
3.	Sanitary Conditions		
	a. Condition of market	10%	
	b. Care of foods	10%	
	c. Personal appearance of help	5%	25%
4.	Price of foods		20%
5.	Service		
	a. In market	10%	
	b. In delivery	5%	15%
6.	Reliability of merchant		10%
			100%

QUESTIONS AND PROBLEMS

1. Name four factors which affect the cost of food.
2. What grade of peas would you order to make pea soup?
3. What would be the wisest size can of pineapple to order for a family of three?
4. Does advertising affect the price of food?
5. Are advertised food products better than others?
6. Why are trade-marked goods reliable?
7. Are private brands reliable?
8. Are bulk foods reliable?
9. Where would you find out about the pure food laws in your state and city?
10. How could you report a case of bad weight or measure?
11. What do you have to know before you can substitute one food for another in the meal plan when marketing?
12. Why do you need to be alert to market for food supplies?
13. Estimate the total amount to be spent for vegetables and fruits for one week, if the food allowance is $8.00.
14. What proportion of that should be spent for milk?
15. What would you substitute for meat in one day's planning?

APPLICATION

1. Market trips. Observe markets in your locality. Make score card for each and compare.
2. Make a list of trade brands of canned goods at local stores. Compare brands as to price and quality. Remember them.
3. Fill in market chart in text with prices and figures as soon as information can be compiled.

HOME PROJECTS

1. Do the marketing with mother for the home for the week.
2. Make personal trips to market.
3. Prepare one food for at least two meals during the week.

LESSON 39

CAKES WITHOUT FAT

Sponge—Angel Food—Uncooked Frostings

Cakes are divided into two classes: (1) *Cakes without fat;* examples, sponge cake, angel food, sunshine cake. (2) *Cakes with fat;* examples, cup and pound cakes.

Cakes without fat contain a large proportion of eggs and very little if any liquid. They depend upon the moisture in the egg and the incorporation of air in the albumen of the egg white to furnish steam and air for leavening power.

True sponge cake mixtures contain no other leavening agent. When eggs are reduced to make a cheaper product, some baking powder is added to furnish the necessary leaven.

Cakes without fat have very delicate texture, and, containing many eggs, need a moderate oven for baking.

Things Essential in Making Cake of Best Quality.—

1. Use only the very best ingredients—strictly fresh eggs, fine granulated sugar, best butter, the best pastry flour, and delicate flavorings.
2. Use accurate measures.
3. Never oil pans for cakes without fat. Oil pans for cakes with fat.
4. Have a uniform heat for cake-baking.
5. Watch the cake during the baking.

Utensils for Mixing.—Use a deep, earthen mixing-bowl and a slotted wooden spoon.

Use a rotary egg beater for beating yolks and a wire whisk for egg whites.

General Method of Combining Ingredients.—Sift the sugar to remove all lumps and separate the grains so that they are easily dissolved in the small amount of liquid used. Sift the flour four or five times before measuring and do not pack it in the cup when measuring. Separate the eggs,

taking care not to get any of the yolk in the white portion. When all utensils are at hand ready for work, beat the yolks until lemon-colored and thick. Beat the egg whites until stiff but not dry. Add the sifted sugar slowly to the yolk mixture while beating. Then add the flavoring and fold in half of the beaten whites very carefully. The folding blends the ingredients without breaking the delicate albuminous walls of the cells holding the air. Beating or stirring would destroy the lightness of the mixture.

Cut and fold the flour into the mixture, then fold in the remaining whites. Turn the mixture carefully into a pan wet with water and one used only for cakes without fat. The unoiled surface of the pan aids in holding up the mixture as it rises. Cakes without fat that are baked in a deep pan or loaf should be baked in a pan with a hollow center (standard angel food pan), so that the heat may penetrate to all parts of the mixture evenly.

Test for Oven Temperature.—Cakes without fat (as shown in the baking chart, Lesson 13, require a temperature between a slow and a moderate oven, or 350° F. If an oven thermometer is not available, test with flour or paper for moderate oven, then reduce the heat slightly.

Moderate oven heat turns white paper light yellow in 5 minutes or turns ½ tsp. of flour light brown in 30 seconds.

When cakes of this class contain either baking powder or soda with an acid, they require a hotter oven temperature than when they are raised with air and steam.

When cakes are baked in too slow an oven they will fall, because there is not sufficient heat to harden the mixture and form a crust while the leavening agent holds the mass up.

Put the cake in the center of the lower rack in the oven at first. Later, move to top rack if the oven does not brown enough. Do not open the oven door too much, and avoid any jar which might cause the cake to fall.

The Baking Time.—Divide the time into quarters:—

1st quarter—the mixture rises.

2nd quarter—it continues rising, begins to brown.

3rd quarter—it continues to brown.

4th quarter—it settles and shrinks from the pan.

If oven is too hot, cover cake with tent made of paper, turn gas down or check fire, or place a pan of cold water in oven. Cake should not be moved in oven before it has risen to full height. If baked too quickly, it will shrink; if underdone, it will fall.

Tests for Cake.—These tests show that cake is done.

1. Cake is done when it shrinks from the sides of the pan.
2. Press the top of the cake with the finger. If it springs back into place, it is done.
3. Insert a small straw in the center of the cake. If it comes out clean and dry, the cake is done.

Care after Baking.—Remove cake from the pan as soon as it is baked. Run a knife around the edge and invert the pan on a wire cooler or board covered with a cloth. If cake sticks to the pan, cover the bottom of the pan with a cold damp cloth for a few minutes.

Frosting for Cake without Fat.—Cakes without fat may be served with or without frostings. Only light frostings are suitable for cakes of such delicate texture. Frost after the cake has cooled slightly. A frosting keeps cake moist. The best frostings may be whipped cream, jelly, jam, or one made of egg whites and powdered sugar called Uncooked Frosting. Boiled frosting may also be used, if desired.

QUESTIONS AND PROBLEMS

1. What kind of a beater is used for beating egg whites? Why?
2. What is meant by folding in the beaten whites of eggs?
3. What is meant by uniform heat for a moderate oven?
4. How can you test for a moderate oven without a thermometer?
5. When should the oven be tested for temperature for cake?
6. Compare a sponge cake rule with that of pop-overs. How is it similar? How does it differ?

7. In substituting baking powder for eggs in a sponge cake rule what quantity would you use for each egg omitted?

8. Could you omit all the eggs and use baking powder?

9. What would be the effect on the texture of the baked product?

APPLICATION

1. Sponge Cake

Yolks 6 eggs	Whites 6 eggs
1 c. sugar	Grated rind ½ lemon
1 tbsp. lemon juice	1 c. flour
¼ tsp. salt	2 tbsp. water

Method.—Beat the yolks until lemon-colored and thick; add the sugar gradually, continue beating; add water, lemon juice, and rind. Fold in the whites of the eggs beaten to s stiff froth. Cut and fold in the flour mixed and sifted with the salt. Bake in a slow oven 300°—350° F. 1 hour in a deep, narrow pan.

(*Basis for 2 girls, ¼ rule.*)

2. Cheap Sponge Cake

1 c. sugar	1 tbsp. lemon juice
5 tbsp. cold water	1⅓ c. pastry flour
2 eggs	2 tsp. baking powder

Method.—Beat the yolks thick, add the sugar and continue beating, and then gradually add the water and lemon juice. Mix and sift the baking powder with the flour and add to the yolks. Beat the egg whites until stiff, and carefully fold into the cake mixture. Bake in an unbuttered tin in a moderate oven, 350° F.

Baking powder takes the place of some eggs as leaven.

3. Washington Pie

Method.—Bake sponge cake in a large pan 1 inch thick. Just before serving make 2 layers of it, using sweetened whipped cream between layers and on the top. Apply the cream with a pastry tube, if you can use one.

4. Angel Food

Whites, 10 large or 11 small eggs	¼ tsp. salt
1½ c. sugar	1 c. pastry flour
1 tsp. cream of tartar	1 tsp. vanilla

Method.—Beat the whites of the eggs until frothy, add the cream of tartar, and continue beating until eggs are stiff. Sift the sugar with the flour and salt six times; then fold into the mixture, and lastly add the vanilla. Bake in an unbuttered pan in a moderate oven, 350° F. for 45 to 50 minutes.

(*Basis for 2 girls, ¼ rule.*)

5. Uncooked Frosting

3 egg whites — Powdered sugar about 1½-1¾ c.
1 tsp. cream tartar — 1 tsp. flavoring

Method.—Add cream of tartar to unbeaten egg whites and one cup of the powdered sugar. Beat all hard for about 10 minutes or until the mixture thickens. Then gradually add enough more sugar while you continue beating to make the mixture thick enough to spread on the cake. Use any flavoring and spread the frosting evenly on the cake. Uncooked frosting is best spread on the cake while it is still warm.

The success of this frosting depends upon the beating at first before more than the one cup of sugar is added. The difference in the quantity of sugar depends upon the size of the egg whites.

VARIATIONS OF UNCOOKED FROSTING

Chocolate Frosting. Add 1 square of melted chocolate to above rule just before spreading on the cake.

Cocoanut Frosting. Add ½ c. grated cocoanut just before spreading on the cake and sprinkle a little over the top of the cake after the cake is frosted.

Colored Frostings. Tint the plain frosting delicately with fruit coloring just before spreading on the cake. Apply the color to the frosting in the same manner as in fondant. A number of different kinds of frostings may be made from the same foundation frosting and a variety of little cakes from the one baking.

6. Orange Frosting

2 egg yolks — 1 tsp. lemon juice
5 tbsp. orange juice — 2 c. powdered sugar
1 tbsp. grated orange rind

Method.—Mix orange and lemon juice with rind and let stand 10 minutes; then strain it. Add to egg yolks, slowly add powdered sugar, and beat until all is added and of the right consistency to spread.

HOME PROJECTS

1. Make sponge cake during the week at home.
2. Market with mother for the food supplies for the week. Learn to know your market.
3. Assist in making out the marketing order sheet for supplies before going to market.

LESSON 40

CAKES WITH FAT

Cup—Layer—Cooked Frostings

Review porportions for drop batters.

Review recipes for baking-powder biscuit and muffin mixtures. Notice the proportion of ingredients. Compare with a plain cake recipe. What ingredients are found in much larger quantities in cakes?

Cakes with fat differ from cakes without fat in the kind of materials used and also in the proportions of the ingredients.

Materials used in cake with fat are strictly fresh eggs, fine granulated sugar, good butter or butter substitute, liquids (milk or water), flour (pastry or bread), flavorings, and a chemical leavening agent.

Sugar.—Either cane or beet sugar may be used, since they are chemically the same. A difference in quality and grade of both kinds occurs, which accounts for the idea that cane and beet sugar are different. Sugar serves as a liquid in the cake mixture. Too much sugar makes a heavy and sticky mixture which causes the cake to fall. Brown sugar may be used in some cake mixtures when spices are used. It contains a small quantity of acid which needs to be neutralized by the addition of soda. Usually $\frac{1}{4}$–$\frac{1}{3}$ teaspoonful of soda is used to each cupful of brown sugar.

Fats.—The kinds of fat used in cake mixtures are good butter of sweet flavor or butter substitutes. Fats serve as a liquid and cake mixtures containing fat are moist and do not dry out quickly. Butter contains more water than butter substitutes. When using the substitutes for cake-making, a smaller amount should be used than the recipe calls for, or approximately 2 tablespoonfuls less for each cupful of substitute than if butter is used for fat.

Fats of pronounced flavors and drippings which may be

used in quick breads should not be used in cakes unless the cake is a spice or chocolate mixture. The fat is combined with the other ingredients in such a way as to separate the grains of sugar and the gluten in the flour and helps to make the product more tender.

Fats should be measured by packing solidly in the spoon or cup and accurate measures are most essential to the success of a cake.

Liquids may be milk, water or half and half, coffee, thin cocoa, fruit juices, sour milk, or buttermilk. One liquid may be easily substituted for another in a cake rule. Products made of milk dry out more quickly and are not as moist as those made of water. Where considerable fat is used water serves the purpose just as well as milk in a cake mixture. If very rich milk or cream is used the quantity of fat should be reduced. Other ingredients such as molasses, sugar, fat, jam, apple sauce, when used, add some liquid.

Flavorings may be varied and include extracts of vanilla, lemon, almond, chocolate, cocoa, spices, orange or lemon juice with grated rind, nuts, raisins, currants or dates.

Commercial flavorings containing alcohol must be added just before baking, since they lose flavor by evaporation when exposed to the air. Always cork the bottle immediately after the flavoring to be used is measured out.

Nuts, *raisins* and *dates* change the texture of a cake mixture when added as well as the flavor. Cake mixtures require more flour to hold their shape when these additions are used. To prevent them from sticking together in the mixture, wash them thoroughly, then dust well with flour to make them dry before adding.

Chocolate contains starch and fat. When added to a cake mixture it tends to make it thicker. In adding chocolate to a standard rule for cakes, less flour is required—approximately 1 teaspoonful less for each square of chocolate added. Cocoa serves as well as chocolate in adding flavor. Approxi-

mately 3 tablespoonfuls of cocoa is equal to one square of chocolate. Cocoa contains more starch than chocolate which fact necessitates using 1 teaspoonful less of flour when substituting it for chocolate in a rule, or using 2 teaspoonfuls less of flour than the rule calls for in adding it to a plain cake rule.

Dry Ingredients include:—flour, spice, cocoa, baking powder, soda, salt, etc.

Flours.—Pastry flour is best, but good soft bread flour may be used in this type of cake to produce a very fine product. Coarse flours are not used in cake mixtures.

To substitute bread flour for pastry flour in a rule, replace 3 tablespoonfuls of each cup of flour with 3 tablespoonfuls of cornstarch. Sift together thoroughly and use as pastry flour. This makes a more tender texture than all bread flour.

Leavening Agent.—A chemical leavening agent, either baking powder or soda with an acid is necessary to produce leavening power in cakes containing fat. The fat in the mixture shortens the gluten in the flour and there is not sufficient albumen in the few eggs used to make the product light with only the air and steam created in the mixing and baking process. The same proportions for baking powder to a cup of flour is used for cakes as for quick breads.

General Method of Mixing Cake with Fat.—Cream the butter, by working it with a slotted wooden or metal mixing spoon until it becomes soft and creamy. This process is called "creaming."

Measure ingredients, dry first and then the liquids and fat. Cream the fat and add the sugar and cream together till the sugar is dissolved and the mixture is creamy. Beat egg yolks until thick. Beat the whites until stiff. Add beaten yolks to creamed mixture; then add liquid alternately with sifted flour, to keep the mixture about the same consistency. If spices are used, sift in with the flour. If fruit or nuts are

used, cover them with flour to prevent them from sticking together and settling to the bottom. Add the whites at the last, by cutting and folding in very carefully; add the flavoring and baking powder at the same time. Do not stir the mixture after the egg whites are in.

Method No. 2, or Muffin Method.—Plain cakes with fat may be made by the same method of combining ingredients that is used in making muffins, when the time is at a premium. The fat in this method is melted instead of creamed. Mix and sift the dry ingredients, flour, baking powder, and salt. Beat the eggs whole or separately. Combine the wet ingredients (beaten eggs, sugar, liquids, and flavoring); then add the melted fat. Add the dry mixture to the sugar and egg mixture. Beat well to blend the ingredients thoroughly.

Adding Eggs.—Eggs may be added to cake mixtures in three different ways: (1) by separating the yolk and white and beating each separately, (2) by beating the whole egg, (3) by adding the whole egg without beating. For cakes without fat and very rich cakes beating eggs separately is best. For other cakes containing baking powder or soda as leavening agent the eggs may be added beaten whole or the whole egg added without beating. In the later method the eggs are added one at a time and the mixture is beaten hard after the addition of each egg.

Pans for Cakes with Fat.—All pans must be thoroughly oiled for cakes of this class. A small rubber-set brush kept for this purpose is the easiest and best for applying the oil evenly to the pan. A piece of soft plain paper dipped in vegetable oil may be used, if a brush is not available. All corners and sides must be well oiled also. Sift a little flour over the pan after oiling before adding the cake mixture. Pans may be lined with plain paper cut to fit the bottom of the pan and oiled. When pans are not the regulation cake pans with the loose bottoms, this method insures the removal of the cake without breaking. The paper comes out of the

pan with the cake and is easily removed while the cake is hot.

Fill pans only ⅔ full of cake mixture to allow ample room for the mixture to rise. See that the mixture comes up into all the corners and make the center a little lower to allow for the raising.

Cakes with fat may be baked in layers, loaf, or individual muffin or fancy cake tins. Cake tins are best made of pressed tin which holds its shape and does not warp.

Temperature for Baking.—Cakes with fat require a hotter oven than cakes without fat. There is a difference, however, in the temperature for baking different cakes in this class, depending upon the thickness of the mixture. Layer cakes are baked in a hotter oven than loaf cakes, because they must bake quickly or they will dry out.

Test the oven and make sure the temperature is right for the type of cake before placing it in the oven.

Layer cakes require a temperature of 350°–400° F., or a moderate oven. Test the oven with flour or paper the same as given in the Quick Bread Lessons.

Cakes containing molasses or chocolate require a lower temperature than plain cake.

Time for baking:—

Cup cakes 12-15 minutes.

Layer cakes 20-30 minutes.

Loaf cakes 45-60 minutes.

The baking, testing, and care of cakes after baking are the same for cakes of both classes.

General Proportions of Ingredients.—For cakes with fat use—

⅓ to ½ as much fat as sugar.

½ as much liquid as flour.

Regard fat or shortening as so much liquid. Sour milk or molasses does not thin a mixture as much as sweet milk or water. Mixtures for fruit must be a little stiffer than those without. The proportion of baking powder and flour is the

same as in quick breads, but the more eggs there are in a cake the less baking powder is needed.

QUESTIONS AND PROBLEMS

1. What is the general proportion of fat to sugar in cakes?
2. If several eggs are used in a cake mixture, how should they be broken?
3. Why are spices sifted with the flour?
4. What is meant by creaming the fat?
5. When may the whole egg be beaten together for mixtures?
6. What effect has beating upon a cake mixture?
7. How should cake tins be filled?
8. What kind of oven temperature is right for cakes with fat?
9. Do cakes require any special treatment after baking?
10. Name three ways you could vary plain cake (standard rule).
11. If sour milk is substituted for sweet milk in a rule, what other change of ingredients is necessary?
12. If egg whites are used in place of the whole eggs in standard rule for plain cake, how many would you need to use?
13. Would the quantity of fat need to be changed?
14. How could you use the yolks of eggs left after making the White Layer cake?

APPLICATION

1. Plain Cake (Standard Rule)

¼ c. fat	½ c. milk
½ c. sugar	1¼ c. flour
¼ tsp. salt	3 tsp. baking powder
1 egg	1 tsp. vanilla

Method.—Cream the fat, add sugar gradually and egg well beaten. Sift the flour and add alternately with the milk. Then add the vanilla, and lastly fold in the baking powder, sifted over the top. Bake 30 minutes in a shallow pan. This rule may be varied in many ways.

(*Basis for 2 girls, ½ rule.*)

VARIATIONS FOR PLAIN CAKES

Many kinds of cakes may be made from a plain-cake recipe. The following are examples:—

White Cake—use 3 egg whites.

Yellow Cake—use 4 egg yolks.

Chocolate Cake—add one ounce melted chocolate (use less flour).

Spice Cake—add ½ tsp. cinnamon, ½ tsp. mixed allspice, nutmeg and cloves.

Fruit Cake—add ½ c. raisins, ¼ c. currants, ¼ c. cut citron.
Nut Cake—add ½ c. cut walnuts or almonds.
Make in layers and use different fillings and frostings.

2. Cup Cakes

⅔ c. fat
2 c. sugar
4 eggs
1 c. milk
3¼ c. flour
4 tsp. baking powder
1 tsp. vanilla or lemon

Method.—Cream the fat and sugar, add yolks of eggs, beat hard, add the milk, and then the flour mixed and sifted with the baking powder. Fold in the beaten whites, add flavoring, and bake in individual tins. Cover with colored frosting. Makes 3 dozen cakes.

(*Basis for 2 girls, ¼ rule.*)

3. Individual Spice Cakes

2 tbsp. melted fat
½ c. brown sugar
½ c. corn sirup
½ c. sour milk
1 egg
1 tsp. cinnamon
¼ tsp. cloves
¼ tsp. soda
1½ c. flour
⅓ c. nuts
1 tsp. vanilla

Method.—Cut the nuts and add melted fat to the sugar. Blend well and add sirup, sour milk, and beaten egg yolk. Sift the dry ingredients together, add nuts, and combine the wet mixture with the dry. Add beaten whites and vanilla. Bake in small muffin pans in a moderate oven, 350° F. Frost with butter frosting just on the top and place a whole raisin in the center.

4. White Layer Cake

½ c. fat
2 c. sugar
1 c. water or milk
1 tsp. vanilla
3 c. flour
4 egg whites or
2 whole eggs
6 tsp. baking powder

Method.—Same as for Chocolate Cake. Makes 3 layers.

(*Basis for 2 girls, ⅓ rule.*)

5. Spanish Chocolate Cake

½ c. fat
1½ c. sugar
4 eggs
½ c. water
1 tsp. vanilla
2 sq. choc. melted
5 tbsp. boiling water
1¾ sc. c. flour
4 tsp. baking powder

Method.—Melt the chocolate, add the boiling water. Cream the fat, add sugar, and cream all thoroughly. Add yolks beaten thick, and beat hard; then add the water, melted chocolate, and gradually the flour.

Beat vigorously. Fold in the stiffly beaten whites of eggs, vanilla, and baking powder. Mix quickly and bake in two layers in a moderate oven, 350°-400° F. Frost with chocolate or caramel frosting.

(*Basis for 2 girls, ¼ rule.*)

6. Cooked Frosting

1 c. sugar	1 egg white
½ c. water	1 tsp. vanilla

Method.—Boil sugar and water together without stirring until it spins a thread when tested. Pour slowly over stiffly beaten egg white. Beat until it holds its shape when dropped from the spoon. Add flavoring, and spread on the cake.

A cooked frosting may be spread on either a hot or a cold cake.

VARIATIONS OF COOKED FROSTING

Chocolate Icing. Add 2 squares of chocolate melted over hot water just after the sirup has been beaten into the egg.

Maple Icing. Use 1½ cupfuls of brown sugar and ½ cupful of granulated sugar in the boiled icing.

Coffee Icing. Use 1 cupful of weak coffee in place of the water in the boiled icing.

Nut Icing. Add 1 cupful of finely chopped nut meat just before spreading on the cake.

Cocoanut Icing. Add cocoanut or chopped raisins.

FILLINGS FOR LAYER CAKE

7. Caramel Filling

2 c. dark brown sugar	½ c. cream
1 c. white sugar	½ c. butter
1 c. hot water	

Method.—Boil sugar and water together until it ropes; then add the cream and butter and cook 4 or 5 minutes longer. Spread between layers and on top. Good with Spanish Chocolate Cake.

8. Cocoanut Filling

Method.—Use uncooked frosting rule, add freshly grated cocoanut, and spread thick between layers and on top.

9. Fig Filling

½ lb. figs chopped fine	⅓ c. boiling water
⅓ c. sugar	1 tbsp. lemon juice

Method.—Mix ingredients in the order given, and cook in a double boiler until thick enough to spread. Spread while hot.

HOME PROJECTS

1. Bake one kind of cake with fat and frost it with boiled frosting.
2. Do the marketing for the home for the week.

LESSON 41

CAKES WITH FAT

Loaf—Butter Frostings

Review proportions for cakes.

Review making cakes with and without butter.

Review oven tests.

Time for baking loaf cakes: 40 to 60 minutes.

Points of a Good Cake.—1. A good cake is smooth on top and baked to an even brown.

2. Cake rounds slightly toward the center, but does not rise abruptly in the center, crack on top, or sink at the edges. If any of these defects occurs, either the cake has been baked too rapidly or too much flour was used.

3. The inside of a good cake is fine, even grained, moist but not sticky, and of the same texture throughout.

Causes of poor cake:—

Uneven rising is due to one of the following reasons:—

1. Cake was baked too rapidly.
2. Cake was placed too near the side of the oven.
3. Too much flour was used.
4. Too much leavening agent was used.

Texture. Coarse grained is due to:—

1. Lack of beating.
2. Careless combining of ingredients.
3. Too slow an oven.

Falling during or after baking is due to:—

1. Too slow an oven.
2. Too little flour.
3. Moving or jarring the cake in oven before it was firmly set.
4. Wrong proportion of fat and sugar.

Cracking is due to:—

1. Too hot an oven at first, which caused a crust

to form before the cake had time to rise sufficiently.

2. Too much flour was used.

Pans for loaf cakes should be deep and have loose ends or bottom to aid in the removal of the cake from the pan when baked. The pan should be prepared in the same manner as for layer cakes.

QUESTIONS AND PROBLEMS

1. What two methods are used for adding the fat to cake mixtures?
2. Is there any difference in the quantity of ingredients for layer cake and loaf cake?
3. What leavening agents are used for loaf cakes?
4. How should nuts be added to a cake mixture?
5. How should spices be added to a cake mixture?
6. How long should loaf cakes bake?

APPLICATION

1. Caramel Cake

1 c. sugar	1 tsp. vanilla
½ c. fat	2 c. flour
½ c. milk	5 egg whites

1½ tsp. baking powder

Method.—Same as any cake with fat, folding beaten whites in last. Bake in a shallow loaf cake pan 40 to 45 minutes in a moderate oven. Frost with Caramel Frosting.

(*Basis for* 2 *girls*, ¼ *rule*).

2. Nut Cake

1½ c. sugar	1 c. walnuts
½ c. fat	4 egg whites
¾ c. cold water	4 tsp. baking powder
2 c. flour	1 tsp. vanilla

Method.—Combine as for cakes with fat. Bake in an oblong loaf cake pan for 50 minutes. Frost with White Uncooked Frosting.

(*Basis for* 2 *girls*, ¼ *rule*).

3. Spiced Loaf Cake

⅓ c. fat	2 c. flour
1 c. brown sugar	1 tsp. soda
½ c. molasses	1 tsp. cinnamon
2 eggs	½ tsp. salt
⅔ c. raisins	½ tsp. cloves
½ c. strong coffee	⅓ c. currants

Method.—Cream fat and sugar and add the molasses and well beaten eggs. Sift the flour, soda, and spices together, add ½ the flour to the batter, and then the fruit, which has been cut and floured. Add the coffee, finally the balance of the flour. Bake in a loaf-cake pan in a moderate oven for 1 hour. Frost with Coffee Frosting.

4. Potato Cake

1 c. fat	2 c. sugar
1 c. almonds	½ c. milk or cream
1 tsp. cinnamon	½ tsp. cloves
½ tsp. nutmeg	1½ c. flour
2 tsp. baking powder	½ cake melted chocolate
1 c. mashed potatoes	4 eggs

Method.—Cream the fat and sugar, add the finely mashed potatoes while warm, then the yolks of eggs well beaten, then the milk or cream, melted chocolate, and spices. Mix and sift the flour and baking powder, cut nuts fine and dredge with flour. Add flour and nuts to the batter, and lastly the whites of the eggs beaten stiff. Bake in square loaf-cake pan 50 to 60 minutes in a moderate oven. This is a very large cake. Frost with Chocolate or Caramel Frosting.

5. Butter Frosting

⅓ c. butter	2 tbsp. cream
1 c. confectioner's sugar	1 tsp. flavoring

Method.—Cream the butter, gradually add the sifted sugar, and beat until the mixture looks like whipped cream. Add the flavoring and cream until of the right consistency to spread. Do not put on a hot cake.

VARIATIONS FOR BUTTER FROSTING

Coffee Icing

Use 2 tablespoonfuls of coffee in place of cream.

Cocoa Icing

Add 2 tablespoonfuls of cocoa to the sugar.

HOME PROJECTS

1. Bake one loaf cake during the week. Frost with cooked frosting.
2. Use the plain foundation frosting rule for your first work.
3. Continue your cooking of some vegetable and some dessert during the week.
4. Set the table and help serve the meal each day, if there is no maid in your home.

LESSON 42

CAKES WITH FAT

Soft Dough—Rolled Cookies

Cookies are baked products made of the same kind of ingredients that are used for cake. They may be divided into two classes, (1) Rolled Cookies, (2) Drop Cookies.

Review proportion of ingredients for soft dough.

Rolled cookies are made from soft dough, rolled thin and cut in shape with a cutter.

Soft-dough cookie mixtures contain a larger quantity of fat than the soft-dough quick-bread mixtures. This larger proportion of fat is needed to make a short crisp product. Cookies containing a small proportion of fat with flour are tough and not crisp.

Materials for rolled cookies are practically the same as for plain cake, but the proportion of ingredients is different inasmuch as the mixture must be stiff enough to be handled on a board and cut in shape, and cookies are usually richer than cake. Rolled cookie mixtures, therefore, contain less liquid in proportion to the quantity of flour and more fat in proportion to the quantity of sugar, than plain cake mixture.

Proportion of ingredients for cookie mixtures: ½ to ⅓ as much butter as sugar. About ⅓ as much liquid as flour or even equal parts. Regard eggs as so much liquid.

Method of combining ingredients is the same as the general method for mixing plain cake.

Cookies are rolled thin (about ⅛ inch thick) or thick (¼ inch. thick).

Thin cookies are crisp; thick cookies are soft.

The rolling and cutting of cookies requires practice and some skill. Only a small quantity of flour should be used on the board, and a slight sprinkling on the rolling pin.

Too much flour makes dry cookies. In using the rolling pin take light strokes without bearing down on the dough. The weight of the rolling pin is almost enough without any pressure. Roll first in one direction, then in another, to make the dough uniform in shape and of even thickness. Roll out only a portion of the dough at a time. Cut with the floured cookie cutter, cutting the cookies close together. Then place them in a pan without touching. Reroll the trimmed-off portions of dough with the next portion to be rolled. Do not handle the dough any more than is necessary. Use a large palate knife to slip under the dough in placing cookies in the pan and also for removing the baked cookies from the pan. Cool the cookies on a wire cake rack, when baked. Do not store until perfectly cold.

Temperature for Baking Cookies.—Cookies require a moderate oven, 350° to 400° F. for 5 to 10 minutes. The pans should be put on the lower rack of the oven at the beginning and may be moved to the upper rack the last few minutes to save time in baking by making room for other pans below. Cookies should turn a rich brown color during baking. If cookies are white, the oven was not hot enough. If they become too dark at first, reduce the heat of the oven and retest the oven temperature before placing the other pans in the oven.

Variations in Cookie Mixtures.—A plain cookie mixture may be varied greatly by the use of different flavors, flour (bread, Graham, or oatmeal), or spices; by varying the quantity of eggs, butter or lard, nuts or cocoanut; by cutting in fancy shapes; and by icing or cooling.

QUESTIONS AND PROBLEMS

1. What is the result of too much handling in rolling cookies?
2. How can you prevent the dough from sticking to the board?
3. Why should cookies be cut close together?
4. Does dough that is trimmed off and rerolled make as good tender cookies as that which is rolled once?

5. Why is a palate knife better for handling cookies than the fingers?

6. What difference does chilling the cookie dough make?

7. Could sour milk be used in place of sweet milk in the standard cooking rule?

8. What difference would the use of sour cream make?

APPLICATION

Demonstrate rolling and cutting cookies.

1. Sugar Cookies (Standard Rule)

1 c. sugar	2 c. flour
½ c. fat	½ tsp. salt
1 egg	3 tsp. baking powder
¼ c. milk	1 tsp. vanilla

Method.—Cream the fat, add the sugar gradually, and cream well with a wooden spoon. Sift the salt and baking powder with the flour. Add the milk gradually to the sugar mixture, then the well beaten egg, then the vanilla, then the flour gradually to make a soft dough. Turn out on a floured board and roll a small portion at a time to ¼ inch thickness. Cut with a floured cookie cutter, place on buttered pan and bake in a hot oven until slightly brown (about 10 minutes). Makes 4 dozen cookies.

(*Basis for 2 girls, ¼ rule*).

VARIATIONS TO SUGAR COOKIES

Chocolate Cookies

Method.—Add 3 tablespoonfuls of melted chocolate to rule for Sugar Cookies.

Sour Milk Cookies

Use ½ c. sour milk, ½ tsp. soda in place of sweet milk and baking powder, use 2 eggs in place of 1.

2. Norwegian Cookies

2¾ c. flour	¼ c. sweet milk
½ c. shortening (half butter, half lard)	2 tsp. baking powder
1 c. sugar	1 tsp. vanilla
1 egg	½ tsp. salt

Method.—Beat the egg thoroughly, add the sugar, and beat hard. Add milk to the egg mixture; beat hard. Sift the baking powder with the flour and rub the cold shortening into the flour with the hands until it is fine like meal; then add the flour, a cupful at a time, to the wet mixture. Make a soft dough and set it in the ice box until quite

cold. Roll out a small portion at a time, very thin, ⅛ inch thick; cut and bake in a quick oven 4 or 5 minutes. Makes 6 dozen cookies.

3. Ginger Snaps

½ c. shortening
1 c. molasses
3¼ c. flour
1 tsp. salt
½ tsp. soda
1 tbsp. ginger
½ c. sugar

Method.—Heat the molasses to boiling point; then add the shortening, which may be butter or half butter and half lard. Mix and sift the dry ingredients and add to the wet. Mix well and chill. Divide the mixture, turn upon a floured board, part at a time, and roll very thin. Use little or no flour in rolling. Cut and bake on buttered baking sheets in a quick oven. Reserve a part of the flour, for all may not be needed. Makes 5 dozen cookies.

(*Basis for 2 girls, ¼ rule*).

4. Filled Cookies

2 c. oatmeal ground fine
2 c. flour
1 c. sugar
1 c. shortening
½ c. thick sour milk
½ tsp. soda
½ tsp. salt

Sweet milk may be used instead of sour. Omit the soda and add 3 tsp. of baking powder.

Filling

1 c. sugar
1 c. water
1 pkg. dates

Method.—Mix and roll out thinly on a floured board. Cut with a cookie cutter and bake 10 to 12 minutes. Stone the dates and put them through a food chopper. Boil the water and sugar for filling until it thickens. To fill, place a teaspoonful between two cookies and press firmly together. Fill cookies only as needed, since they become too soft if allowed to stand a day or two.

5. Frozen Cookies

1 c. white sugar
1 c. brown sugar
1½ c. vegetable oil
3 eggs
1 pkg. dates
4 c. flour
1 tsp. soda
1 tsp. salt
1 tsp. cinnamon
1 c. nuts

Method.—Cut the dates and nuts. Add the oil to the white sugar, and cream. Then add the brown sugar and cream again. Add eggs one at a tine, and beat hard after adding. Sift dry ingredients to-

gether. Add the cut dates and nuts. Then combine the dry and wet mixtures. Pack in a loaf pan, and set to freeze over night. To cut, turn the loaf out of the pan and keep the mixture very cold. Use a thin, sharp knife, and cut off slices as thin as possible. Bake in a moderate oven 8 to 10 minutes. Store in covered jars.

These cookies should be made in the winter time, when they can be frozen, in order to cut and handle more easily.

HOME PROJECTS

1. Make rolled cookies on Saturday.
2. Practice rolling and cutting on plain cookies before attempting rule 2 or 6, either of which requires considerable technic in cutting very thin.

LESSON 43

CAKES WITH FAT

Drop Batters—Drop Cookies

Drop cookies are made from drop batter mixtures stiff enough to hold their shape when dropped on the baking sheet, but not stiff enough to be rolled out and cut.

Review proportions of ingredients for drop batters.

The materials for drop batters are the same as for rolled cookies, with nuts, raisins, dates, spices, for flavoring.

The proportions of ingredients and methods of mixing are the same as for cake mixtures.

Pans for drop cookies should be of smooth tin, well washed and oiled, so that the cookies come out readily. Drop batter by tablespoonful on pan 3 inches apart, so that they do not run together and that all are done at one time.

Time for baking drop cookies: 10 to 12 minutes.

Temperature for baking drop cookies 350° to 400° F., or a moderate oven.

QUESTIONS AND PROBLEMS

1. What is the best method of beating egg yolks? Egg whites?
2. How are nuts prepared for baked products?
3. What preparation is necessary for raisins? Dates?
4. How are baking powder and soda measured? Flour?
5. Are nuts better ground in a food chopper or cut with a knife?

APPLICATION

1. Chocolate Cookies

1 c. sugar	½ c. melted fat
2 eggs	1 even tsp. soda
½ c. milk	2 c. flour
1 c. raisins and nuts	3 squares chocolate

1 tsp. vanilla

Method.—Mix the melted fat with the sugar. Add the beaten yolks and melted chocolate Add soda to the milk and then add the milk and ½ the flour to the sugar and eggs. Mix well. Add the

raisins with the remainder of the flour. Add beaten whites and vanilla and beat well. Drop from the spoon to bake on buttered baking sheets. May be frosted with fudge frosting.

(*Basis for* 2 *girls,* ¼ *rule.*)

2. Rocks

1½ c. brown sugar	1 c. fat
3 eggs	¼ tsp. cloves
1 tsp. cinnamon	3 c. flour
2 c. raisins	1½ c. English walnuts
1 tsp. soda	

Method.—Cream fat and sugar well. Add the beaten yolks. Mix spices and soda with the flour and add to the sugar mixture. Flour fruit and nuts and add to mixture. Add the beaten whites and mix well. Drop from spoon and bake 10 minutes. Makes 3 dozen.

(*Basis for* 2 *girls,* ¼ *rule.*)

3. Brownies

1 c. sugar	¼ c. melted fat
½ c. flour	½ c. walnuts
1 egg	2 squares of chocolate, melted

Method.—Combine ingredients as in muffin method. Spread mixture on well-oiled square cake tin, and bake 10 minutes in a moderate oven. Cut in 2-inch squares as soon as removed from the oven.

4. Date Bars

3 eggs	1 c. flour
1 pkg. dates	1 tsp. baking powder
1 c. nuts	1 tsp. salt

Method.—Cut dates and nuts into small pieces, but do not grind in the food chopper. Sift dry ingredients and add the dates and nuts to them. Separate eggs and beat yolks. Then add the sugar to the yolks. Add the sugar mixture to the dry ingredients. Beat whites until stiff, then fold into the mixture. Spread ½ inch thick in a shallow pan and bake 15 to 20 minutes in a moderate oven. When cool, cut in bars 4 inches long and 1 inch wide. Roll in powdered sugar just before serving.

HOME PROJECTS

1. Make drop cookies at home and practice till you can be sure.
2. Make Christmas boxes and fill with 1 or 2 kinds of cookies, and give as Christmas gifts in place of candies this year. Add glass of your choice jelly to the basket. Arrange neatly, using paraffin paper.

Suggestions: Have a Christmas sale of cookies and cakes at school. Take orders for Christmas boxes. Use fancy boxes or baskets.

LESSON 44

MEAT

Cooking Tender Meats—Broiling, Roasting

Meat includes the flesh of all animals used for food, as beef, veal, mutton, pork, fish, poultry, and game.

Beef is from the steer or cow.

Veal is from the six to eight weeks' old calf.

Mutton is from sheep over 1 year old.

Lamb is from the young sheep, 6 to 8 weeks to 1 year old.

Pork is from the pig.

Fish, including crabs, shrimps, lobsters and oysters.

Poultry includes chickens, turkeys, ducks, and geese.

Game includes wild animals and fowl; as, deer, quail, partridges

Structure of Meat.—Meat consists of muscles, connective tissue, bone, and fat.

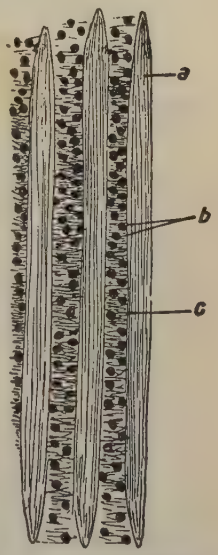


Diagram illustrating structure of meat; *a*, muscle fibers; *b*, fat cells; *c*, connective tissue. (Hutchison).

The muscles are made up of bundles of fibers or cells bound together by connective tissue. The muscle fibers are long tubes which contain protein, extractives, mineral salts, and water. The connective tissue is very tough. Those of much-used muscles, as in the neck or legs, are much stronger than those of muscles not greatly used, as in the back.

The bones consist of about half solid matter and half water. The solid part is composed of two thirds mineral matter and one third animal matter, chiefly fat and ossein. Some bones are hollow, and contain a fatty substance called marrow. At the ends of bones and connecting bones at the joints are bands of cartilage, or gristle, which is like soft

bone. In young animals the bones are soft, becoming harder with age, as the proportion of mineral matter increases.

The fat occurs under the skin, between the bundles of fibers, and around the internal organs.

Composition of Meat.—Meats are similar in composition but different cuts of the same animal will differ in the proportion of food principles, as will also the same cuts from different animals. This fact is due to the nature and condition of the animal and the manner of feeding. Meat contains large percentages of protein, fat, and water, with only a small per cent of mineral matter. There is no carbohydrate in meat.

Protein.—The quantity of protein is about the same—13 to 20 per cent—in all meat, but is of several different kinds. The protein of meat exists mainly in the muscle fibers, and connective tissues.

The chief protein in muscle fiber is albumin, called "myosin," which is similar to that found in eggs. Muscle proteins contain many other substances, as amino acids, necessary for promoting and sustaining life, and are, therefore, complete proteins.

The chief protein in connective tissues, cartilage, and tendons, is called "collagen." This is extracted by long slow cooking in hot water, and yields gelatin, which dissolves in hot water but thickens when cold. Collagen is an incomplete protein, since it does not contain the necessary amino acids for growth promoting and, while it may sustain a fully grown person in normal health for some time, when it is used alone, it will not promote the growth of children requiring body-building proteins.

The extractives, or muscle juices, contain some nitrogenous substances which differ in nature and composition from the proteins in the muscle walls, and also from the protein of the connective tissues. These substances have little if any food value, but give the meat its characteristic

flavor and are useful only in stimulating the appetite and flow of the digestive juices. Young animals have more myosin, while old ones have more nitrogenous extractives.

Mineral Matter.—The chief inorganic salts in meat are: potassium, sodium, phosphorus, magnesium, iron, chlorine, and sulphur. The quantity of mineral matter in meat is less than one per cent. This is found in larger proportions in the older animals and is abundant in the extractives.

Fat in meat varies in amount very widely. Much is lost in the preparation for market, in cooking, and at the table, so that only about one half the amount of fat is available to the body. Older animals well fed have more fat than young animals. The fat takes the place of some of the water, and does not affect the protein.

Generally speaking, the greater quantity of fat a meat contains the less the quantity of water.

Pork contains much more fat than the other meats.

Water makes up about three fourths of the weight of meat, but varies greatly—from 50 to 75 per cent. It is much more abundant in the young animals than in the old. Veal and lamb contain more water than beef and mutton.

APPROXIMATE COMPOSITION OF MEAT

Protein	Water	Fat	Ash
20%	70 to 75%	2 to 5%	1%

Food Value.—Meat is the most important of the protein foods. It is like the human body in structure and composition and fully supplies the necessary protein and fat to build and repair body tissues and give heat and energy. It is easily and thoroughly digested when used in proper quantity. Fat meats are harder to digest than lean meats, because the fat interferes with the digestion of the protein in the stomach. Meats with loose fibers are easier to digest than those with close fibers, for the digestive juices can act more readily upon them. The extractives stimulate the body activity, and persons who use animal food in

their diet seem to have a greater vitality than those who live entirely on vegetables.

Only very active persons doing much physical work need meat more often than twice a day. For most persons a meat dish a day is enough. Meat must be accompanied with dishes of the carbohydrate class.

EXPERIMENTS

The Effect of Dry Heat on Meat

1. Scrape a small piece of the muscle of beef with a sharp knife until all the soft part is scraped off. Examine each portion and compare. Which is the connective tissue and which is the muscle fiber?

2. Roll a portion of this muscle fiber into a little cake ¼ inch thick. Place it in a hot frying pan. Sear on one side, then turn and sear the other side. Salt it, examine it, and taste it.

3. Put a portion of the connective tissue in a frying pan and treat as you did the muscle fiber. Examine it. What effect has dry heat on muscle fiber? On connective tissue?

The Effect of Moist Heat on Meat

4. Put a piece of muscle fiber into a pan. Add boiling water to cover and simmer 10 minutes. Salt it, taste the meat, and save the water.

5. Put a piece of connective tissue in another pan and treat the same way, simmering it for half an hour. What effect has moist heat upon muscle fiber? On connective tissue? Which method of applying heat to meat is best for muscle fiber? For meat containing much connective tissue?

6. From these experiments, 1, 2, 3, and 4, answer questions 1, 2, 3, and 4 under Questions and Problems.

The Effect of Heat on the Protein in Meat

7. Put a small piece of meat into cold water. Let it stand 10 minutes.

8. Put a small piece of meat into boiling water. Let it stand 10 minutes.

9. Put a small piece of meat into a hot frying pan and turn several times.

Note the change in texture and color of the meat. Note the color of the water in each case. Then answer questions 5, 6 and 7 under Questions and Problems.

The objects of cooking meat are:—

1. To develop flavor.
2. To improve the appearance.
3. To soften the connective tissues when present in large quantity.
4. To kill any living organisms that may be present.
5. To retain juices, as in broiling or roasting.
6. To extract juices, as in soups or beef tea.

Cooking of Meats.—When meat is subjected to a moderate temperature in cooking, it becomes more digestible, since the hard connective tissues and the albuminous walls of the muscle fibers are softened. Both the flavor and the appearance of the meat are improved. In order to avoid a loss of juice and nutrients the cut ends of the muscle fibers should be closed as soon as possible when the cooking process is begun. This result is accomplished

1. By applying dry heat directly to the cut surface of the meat, as in broiling or roasting,
2. By putting the meat directly in boiling water, as in boiling,
3. By cooking in fat, as in frying or sautéing.

The albumin in the meat is coagulated by the high temperature, and forms a coating on the surface of the meat, thus sealing up the cut ends of the muscle fibers, and retaining the juices. To continue the high temperature after the surface of the meat is seared causes the albumin on the outside to become hard and tough (just as the albumen of the egg becomes hard and tough when cooked at boiling temperature) before the heat can penetrate, and cook the inside sufficiently. In all meat cooking a temperature below boiling-point must be maintained after the closing of the surface, or searing process, in order to insure an evenly cooked tender meat fiber.

Meat which contains only a small quantity of connective tissue may be cooked in less time and by a different method

than meat which has a large proportion of this tissue.

Tender and Tough Meat.—For cooking purposes meat may be said to be divided into two classes: (1) tender meat, (2) tough meat. This division is due to several factors, namely, the age, kind, and feeding of the animal, the length of time after slaughtering and the quantity of connective tissue it contains. The meat from young animals is more tender than that of old animals. This fact is due to the amount of connective tissue that it contains. Connective tissues increase in quantity and toughness as age and activity of the muscles increase. The meat from well-fed animals is more tender and juicy than that from animals deprived of good care and feeding.

If meat is eaten soon after being slaughtered, it is tougher than meat that is hung and ripened. When the animal is slaughtered, the muscles are soft and contain much juice. Very soon after, however, the muscles become stiff and hard, and the meat is tough. During this stage the meat is hung until the muscles again soften. The softening of the muscle fibers is due to the formation of acids in the meat, and these produce a different flavor which is regarded by most persons as very desirable. In some sections of the country meat is hung longer than in others, but two to three weeks is the average time of ripening to make tender, tasty meat.

The quantity of connective tissue varies in different parts of the same animal. The greater activity of the muscles the greater is the proportion of connective tissue. Meat from the legs and neck, therefore, contain more connective tissue, and is tougher than that from the back.

Method of Cutting Meat.—The method of cutting beef, veal, mutton, lamb, and pork into parts, and the names used for different cuts varies somewhat in different localities. Beef is cut into more cuts than the other meat, but all are divided into halves lengthwise along the back, and then again divided into fore and hind quarters.

BEEF

The best beef is from the steer between three and four years of age. Each half, or side, weighs about 450 pounds, and is divided into quarters between the twelfth and thirteenth rib, leaving one rib on the hind quarter. The fore quarter contains more irregular muscles and connective tissue, and the meat, therefore, is of poorer grade than that from the hind quarter. The more tender cuts of meat and consequently the most expensive cuts lie just back of the center of the back along the backbone. These decrease in quality and price as the distance from the center increases. The most tender and expensive cuts, however, do not contain proportionately more food value. The tougher cuts of meat are fully as nutritious, and, if properly cooked, seasoned, and served, are well flavored and cost much less.

The wholesale cuts of beef: *1*, round; *2*, rump; *3*, shank; *4*, loin; *5*, flank; *6*, rib; *7*, chuck; *8*, clod; *9*, neck; *10*, plate, which includes *11*, brisket; *12*, shank.—*Courtesy Iowa State College of Agriculture.*

The internal organs are sometimes used for cooking, but are not as nutritious as other parts of the animal. They are used mainly for giving variety in meats.

Appearance.—Good beef is bright red, fine grained, and well marked with fat. The fat is fine and light yellow in color; the fat around the vital organs is white and crumbly and is called suet. Flabby, dark, coarse beef with yellow fat indicates a poor quality. Beef from an old or underfed animal has very little fat.

BEEF CHART

Name of Cuts	Calories per Lb. Uncooked	Comparative Cost	Cooking Helps	How Used
Shank	545	Least Expense	Sear, cook slowly	Stews and soups
Round	895	Economical	" " quickly	Steaks, and roasts, heel for pot roasts and stews
Rump	1110	Medium	" " slowly	Steaks, pot roasts, braising and corning.
Sirloin	985	Reasonable	" " quickly	Steaks
Pin Bone	1110	"	" " "	Steaks
Porterhouse	1110	"	" " "	Choicest steaks
Prime Ribs	1155	"	" " "	Best roasts
Short Ribs	840	Economical	" " slowly	Roasts and stews
Flank	1115	"	" " "	Steaks, stews, braising
Plate	1285	"	" " "	Stews, soups, corning
Brisket	1165	"	" " "	Stews, pot roasts, soups
Chuck	1105	"	" " "	Roasts, steaks, pot roasts, boiling, stews
Shoulder Clod	720	"	" " "	Steaks and pot roast
Neck	770	"	" " "	Soups, stews and corning

VEAL

Appearance.—Veal is pale pink and the fat is clear white. The best comes from a calf two months old.

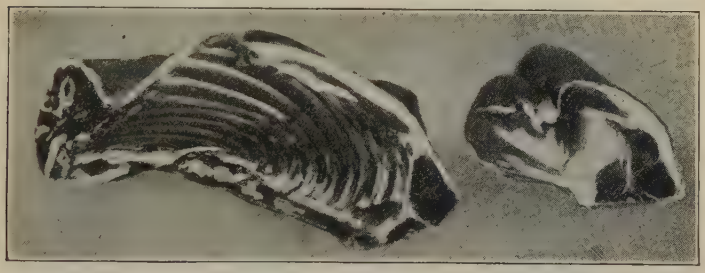
VEAL CHART

Name of Cuts	Calories per Lb. Uncooked	Comparative Cost	Cooking Helps	How Used
Breast	740	Reasonable	Sear—cook slowly	Roast—baked
Shoulder		"	" "	" "
Chuck	515	Low	" "	Roast—steak
Flank	820	"	" " Steak— quickly	Casserole
Leg	755	Reasonable	" slowly	Roast—steaks
Loin	690	"	" "	Steaks—roasts
Rib	480	"	" quickly	Roast—chops
Rump	735	Medium	" "	Roast—pot roast
Shank	580	Low	" slowly " "	—steak Soup—stew

LAMB

Appearance.—The meat of lamb is red and the fat is white. The bones are red and turn white with age.

Kinds.—Spring lamb is from 6 to 8 weeks old. Yearlings are about one year old. The best lamb comes from animals 6 weeks to 3 months old. Lamb may be used as soon as killed.



Lamb cuts from the rib and loin.

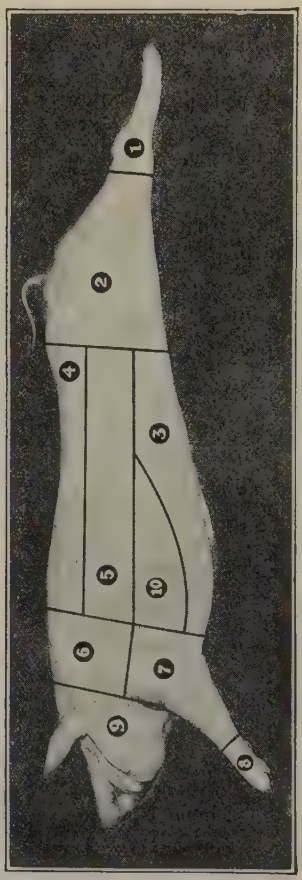
MUTTON

Appearance.—The meat of mutton is bright red, the fat is yellowish, and the bones are white. The layer of fat next to the skin in mutton has a very strong flavor of oil and wool, which makes it very distasteful to most persons. This should be removed before cooking. Mutton must hang to ripen.

LAMB AND MUTTON CHART

Name of Cuts	Calories per Lb. Uncooked	Comparative Cost	Cooking Helps	How Used
Leg (hind).....	1105	Reasonable	Sear—cook slowly	Roasts
Loin	1795	"	" "	Chops, roasts
Rack..... (Corresponds with Rib Chops	1350	"	" "	Chops, crown roasts
Shoulder or Chuck....	910	Medium	" "	Stews
Neck.....	986	Low	" "	Stews, casserole
Plate..... Flank	1560	Low	" "	Roasts, stews

Cuts of mutton: *1*, leg (hind); *2*, loin; *3*, rack; *4*, shoulder or chuck; *5*, neck; *6*, plate; *7*, flank. —*Courtesy of Armour & Co.*



Cuts of pork: *1* and *8*, foot; *2*, ham; *3*, belly (bacon); *4*, fat back; *5*, loin; *6*, Boston butt; *7*, picnic; *6* and *7*, shoulder; *9*, neck; *10*, spare ribs.—*Courtesy of Armour & Co.*

The meat charts given in this chapter are by courtesy of Armour & Co.

PORK

Appearance.—Fresh pork is pale red in color and firm in texture; the fat is white. Pork is more liable to be diseased than any other meat. Diseased pork appears speckled or lumpy. The specks are little worms, called trichinae, which get into the muscle of the hog. When taken into our bodies, these are very harmful. They become active and produce a disease called trichinosis, which is nearly always fatal.

For this reason pork should be cooked very thoroughly to kill the trichinae. Pork requires 20 to 30 minutes per pound for cooking. Smoking *does not* kill trichinae. The frequent use of smoked ham without further cooking is liable to be very injurious.

PORK CHART

Name of Cuts	Calories per Lb. Uncooked	Comparative Cost	Cooking Helps	How Used
Foot	365	Low	Long, slow cooking	Stewed, pickled boiled or fried
Ham.....	1345	Resonable	Long, slow cooking	Smoked, then boiled or baked whole; steaks—sautéed, broiled
Belly (bacon)..	1455	Reasonable	Slow cooking	Smoked—broiled
Fat Back (salt pork)...	3860	Medium	Slow cooking	Boiled with vegetables
Pork Loin	1270	Reasonable	Moderate heat	Chops and roasts
Boston Butt...	1340	Low	Sear—cook slowly	Cheaper steaks and roasts
Green Picnic...	1480	Medium	" "	Steaks, roasts, boiling
Shoulder.....				
Neck.....	3435	Low	" "	Stewed, baked or braised
Spare Ribs....		Low	" "	Baked or boiled

CARE AND PREPARATION OF MEAT

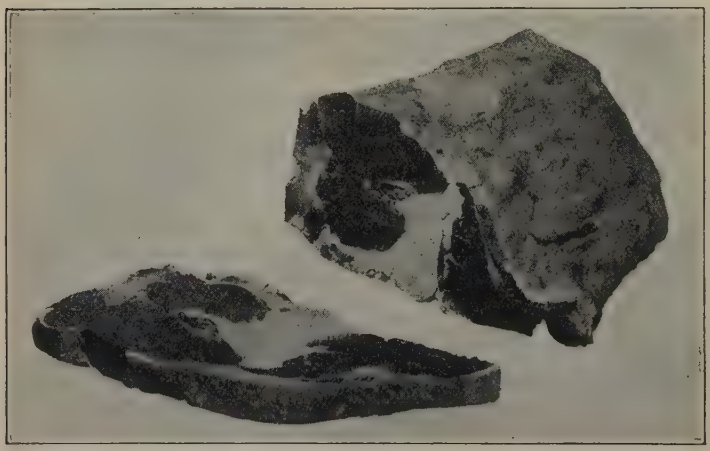
Care of Meat.—1. Remove meat from paper as soon as delivered.

2. Keep meat in a cool place, but not directly on ice.

3. Before cooking always wipe meat well with a damp cloth wrung out of cold water. Never wash meat in water.

Retaining Juices.—Juices may be retained in the cooked

Loin end of beef, showing sirloin steak.—*Courtesy Iowa State College of Agriculture.*



Short loin of beef, showing porterhouse steak.—*Courtesy Iowa State College of Agriculture.*

meat by broiling, roasting, frying, or sautéing, which sears over at once the outside of the meat and seals up the little tubes that contain the juices. Only tender cuts of meat can be used in this way. Tough meats require a long, slow heat.

Cooking of Meat.—Tender cuts of meat are best cooked by the application of dry heat, as in broiling and roasting.

Broiling is cooking by direct heat. The meat is placed under the gas flame or over glowing coals, thus searing the outside and retaining the juices. The temperature at first should be high enough to form the albuminous coating on the surface, then the heat modified to cook the interior without a loss of nutrients or a toughening of the outside. The browning of the outside of the meat improves the flavor.

Pan broiling is cooking in a hot frying pan without any fat. The hot metal sears the surface just as the hot flame.

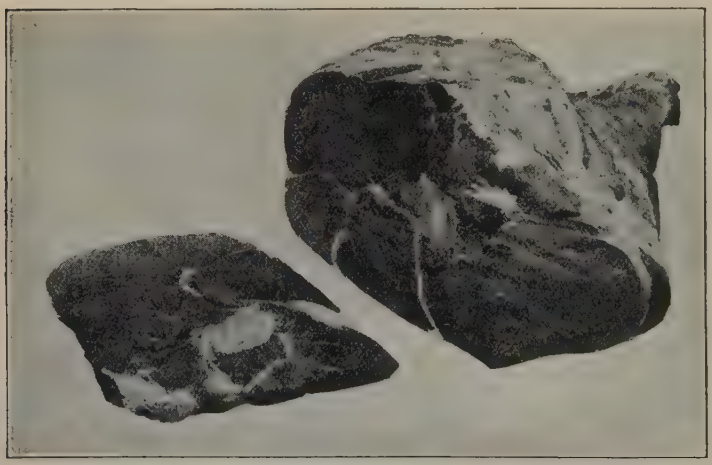
Steaks, chops, and fish, which require a short time for cooking are broiled. The best cuts of beef for broiling are: (1) porterhouse (2) sirloin, (3) tenderloin, and (4) round.

TIME GUIDE FOR BROILING

Beef (rare), per pound	8-10 minutes
Beef (well done), per pound	12-15 minutes
Lamb Chops	6- 8 minutes
Pork Chops	15-20 minutes

Roasting originally meant cooking by hanging meat in front of a fire, and exposing it to the direct heat for a long time to insure the interior cooking of the meat. Roasting now means the cooking of meat in a roasting or baking pan in the oven. Sufficient moisture and fat is contained in the meat to furnish the moisture for cooking and basting. True broiling and roasting does not require the addition of any water. If the meat contains an average quantity of fat, no other fat is necessary. Very lean meats may have a strip or two of fat laid on the top to baste with. Meats containing much fat should have some of the melted fat poured out of the pan during roasting.

Prime ribs of beef, showing standing rib roast and folded rib roast.—*Courtesy of Iowa State College of Agriculture.*



Round of beef, left showing inside of leg and right showing outside.—*Courtesy of Iowa State College of Agriculture.*

TIME GUIDE FOR ROASTING

Beef, per pound	15-20	minutes
Mutton, per pound	15-20	minutes
Veal and lamb, per pound	15	minutes
Pork, per pound	25-30	minutes

QUESTIONS AND PROBLEMS

1. How could you tell what kind of meat should be cooked with dry heat?
2. When should meat be cooked with moist heat?
3. Which kind of heat develops the best flavor?
4. Does connective tissue require short or long application of heat to soften it?
5. How should heat be applied to meat in order to retain its juices?
6. What substance in meats coagulates with high temperature to cause the result in experiment 6?
7. What is the best steak for a family of four for oven broiling?
8. What is the price per pound of round steak? Sirloin steak? Porterhouse?
9. Which steak contains the most bone and waste for the price?
10. What would be the result of broiling steak at too high a temperature?
11. What effect on the digestion of meat has cooking it by sautéing, or frying?
12. How long should a five-pound roast of beef cook?

APPLICATION

1. Broiled Steak—Oven

Sirloin steak 1 to 2 inches thick
Butter, salt, pepper
Parsley and lemon for garnishing

Method.—Wipe the meat with a damp cloth and trim off extra fat. Have the broiler smoking hot and rub with a little fat. Place the meat on the broiler and broil, turning every 10 seconds for the first minute. (Use two large spoons for turning, as a fork would pierce the meat). After the first minute turn occasionally until well cooked on both sides. Remove to hot platter, spread with butter, and sprinkle with salt and pepper. Garnish with parsley and slices of lemon.

2. Pan-broiled Steak

Round steak, ¾-1 inch thick Salt, pepper, butter

Method.—Wipe meat with a damp cloth and remove the extra

fat. Heat the frying pan very hot. Put the meat in and as soon as one side is seared turn to sear the other side. Turn frequently for the first minute. Cook 6 to 8 minutes, turning occasionally. Spread with a little butter and sprinkle with salt and pepper. Remove to a hot platter and garnish with parsley for serving.

(*Basis for* 2 *girls*, 1 *piece* 2½ *inches square*).

3. Lamb Chops Broiled

Method.—Wipe chops and put in red-hot frying pan. As soon as the under surface is seared, turn and sear the other side. Turn often, using spoon, so as not to pierce surface. If liked rare, cook 6 minutes. Let chops stand on edge in the frying pan to brown the outside fat. When nearly cooked, sprinkle with salt. Drain on plain paper and spread with butter.

Rib chops which have the bone cut short and scraped clean nearly to the lean meat are called *French chops*. Chops for pan broiling should have the flank and most of the fat removed.

4. Roast Beef

Method.—Wipe, put on a rack in a dripping pan, skin side down, and rub over with salt and dredge with flour. Place in a hot oven, that the surface may be quickly seared, thus preventing the escape of inner juices. After the flour in the pan is browned, reduce heat, and baste with the fat that has melted. If meat is quite lean, it may be necessary to put trimmings of fat in the pan. Baste every 10 minutes. If this rule is followed, meat will be found more juicy. When meat is about half done, turn it over and dredge with flour, that the skin side may be uppermost for final browning. If there is danger that the flour in the pan may burn, add a small quantity of water.

Beef, to be well roasted, should be started in a hot oven and the heat later decreased, so that, when carved, the slices will be red throughout, with a crisp layer of golden brown fat on top. Beef roasted at a temperature so high that the surface is hardened before heat can penetrate to the center is most unsatisfactory.

Sirloin or rib roast may have the bones removed, and be rolled, skewered, and tied in shape.

Roast Beef Gravy

Method.—Remove some of the fat from the pan, leaving 4 tbsp. Place on the front of the range, add 4 tbsp. flour and stir until well browned, the flour browned in the pan giving additional color to the gravy. Add gradually 1½ cupfuls of milk, cook 5 minutes, season with salt and pepper, and strain. If the flour should burn in the pan, the gravy will be full of black carbon particles.

5. Roast Lamb

Method.—Wipe meat (leg of lamb), sprinkle with salt and pepper, place on a rack in dripping pan, and dredge meat and bottom of pan with flour. Place in hot oven, and baste as soon as the flour in the pan is brown and every 15 minutes afterward. Cook about 1¾ hours. If the flour in the pan burns, add a small quantity of water while the meat is cooking. Serve with Mint Sauce.

Mint Sauce

½ c. mint leaves chopped fine 2 tbsp. powdered sugar
1 c. hot vinegar

Method.—Dissolve the sugar in the vinegar and pour over the chopped mint leaves. Let stand 30 minutes to infuse. If the vinegar is very strong, dilute with water. Serve hot.

HOME PROJECTS

1. Plan a simple dinner of potatoes, one other vegetable, and a simple dessert for one dinner next week. Broil the steak by either oven or pan broiling, and make the dessert yourself.
2. Roast some meat for one dinner.
3. Make a score card for meat markets in your locality in the same manner as your grocery score card.
4. Get the prices for the different cuts of meat for broiling and roasting from your local market, and write them on your marketing chart.

LESSON 45

MEAT

Cooking Tough Meat

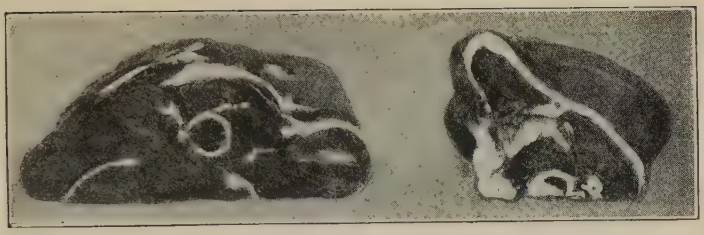
Tough meats are best cooked by the application of moist heat, either water or steam. The four usual methods of cooking meat by moist heat are boiling, stewing, braising, and pot roasting.

Boiling is cooking in water deep enough to cover—adding the meat directly to the boiling water at first to form the surface seal, and then reducing the temperature of the water for the remainder of the cooking period.

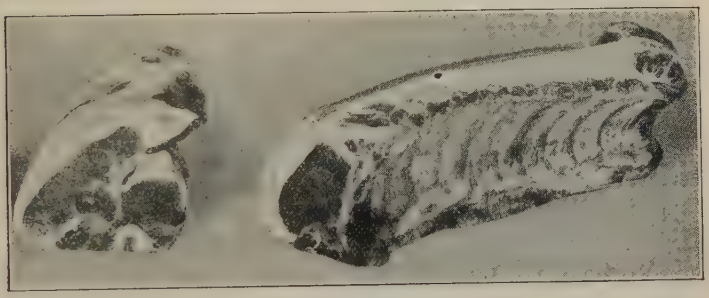
Stewing is long slow cooking in a limited quantity of water below the boiling point. The meat is cut in small pieces and browned first to give it a good rich flavor and retain much of the juice. The pot is tightly covered, and the enclosed steam assists in the cooking. More nutrients are drawn out in the liquor by stewing than by boiling, and the liquor is served with the meat as gravy.

Pot roasting is cooking in a kettle on the top of the stove by first searing the surface of the meat on all sides by contact with the hot metal, then adding a small quantity of water to create steam to carry on the cooking process. It requires a moderate fire and about the same time as for oven roasting.

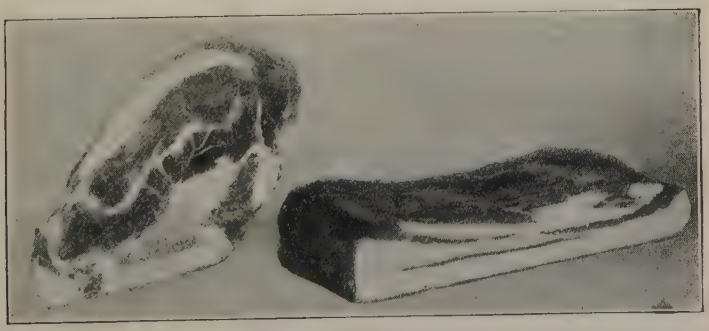
Braising is similar to pot roasting except that it is cooking in a deep covered pan or casserole in the oven instead of on the top of the stove. The meat is first floured and browned in smoking fat, then placed in the baking pan with a small amount of water. The temperature after the browning process must be low. If the meat is cut in pieces suitable to individual servings, it may be served in the baking dish with its own liquor. Whole potatoes and vegetables may be added to the dish the last half hour of cooking, and the whole served in the baking dish.



Cuts of veal—leg and loin.



Cuts of pork—loin and ribs.



Cuts of pork—loin and bacon.

The fireless cooker is one of the best means of cooking tough meat at the least cost, since a temperature below the boiling point may be maintained for a long time without fuel. The cookers equipped with soapstone radiators and a steam vent to permit the steam to pass off are better for cooking meats than the other fireless cookers, since it is possible to brown the meat and get a better flavor.

Comparative food value of meats:—

Beef has the greatest food value of all meat and is in season the year round.

Mutton comes next to beef in food value. The red meat of beef and mutton is more stimulating than the white meat of veal and poultry.

Veal and lamb are less nutritious than the flesh of the full-grown animals.

Pork is usually so fat that it is difficult to digest on account of the large amount of fat between the fibers. It furnishes so much heat and energy to the body that, together with other foods in the diet, it may furnish an excess of heat, and for most persons must not be used as regularly as beef. Bacon is not difficult to digest and can be eaten by persons to whom others fats are intolerable.

What to Serve with Beef.—*With steak*, serve fried onions, baked, French fried, or au gratin potatoes, combination salad, or mushrooms.

With roasts, serve either mashed, creamed, or roast brown potatoes, sweet potatoes, peas, corn, currant jelly, or Yorkshire pudding.

What to Serve with Veal.—*With cutlets* or *chops* serve peas, rice croquettes.

With stewed veal serve dumplings, baked potatoes.

With veal loaf or roast serve peas, asparagus, spinach, cauliflower, rice, white or sweet potatoes.

What to Serve with Mutton.—*With broiled chops* serve creamed potatoes, peas.

With leg of mutton serve caper sauce, rice, mint sauce, cabbage, or creamed turnips.

With saddle of mutton serve baked macaroni without cheese, peas, or asparagus tips.

With cold mutton serve sliced tomatoes with French dressing.

What to Serve with Lamb.—*With roast lamb* serve mint sauce, boiled rice, cucumbers, white or sweet potatoes, squash, parsnips, eggplant, new peas, or asparagus tips.

With cold lamb serve lettuce, mint salad with French dressing.

What to Serve with Ham or Pork.—White or sweet potatoes, squash, beets, greens, cauliflower, cabbage, apple sauce, fried apples, fritters or croquettes.

QUESTIONS AND PROBLEMS

1. Why should tough meat be cooked below boiling temperature?
2. Why should the temperature be reduced after the meat is seared?
3. What is the purpose of searing meat?
4. Why are vegetables added to stews at the last instead of at the first part of the process?
5. How does the price of chuck and plate cuts used for stews compare with the round?
6. Is there any difference in the appearance of the muscle fibers of these cuts?
7. Which has the most connective tissue?
8. How can you distinguish veal from lamb ?
9. How can you distinguish lamb from mutton?
10. Why is pork more difficult to digest than other meat?

APPLICATION

1. Beef Stew

2 lbs. beef (cut into inch cubes)
¼ c. flour
Water
4 potatoes (sliced)
Salt and pepper
1 carrot } cut in ½ inch dice
1 turnips }
2 small onions (sliced)

Method.—Wipe the meat and cut best portions into inch cubes. Put the bone and poorer portions of meat, cut fine, into cold water and cook them slowly. Try out some pieces of beef fat in a frying pan and

remove scraps. Roll the best portions of meat in flour; cook in a frying pan until brown, stirring with a knife so that all surfaces may be browned. Brown the onions also. Put the meat and onions into the kettle in which the stew is to be cooked. Rinse out frying pan with hot water and turn the water into the stew. Cover meat with boiling water and cook slowly at least 2 hours or until the meat is tender. Remove the bone and poorer portions of meat, strain the liquid into the stew, add the vegetables (excepting potatoes), and cook stew about 45 minutes longer. Parboil the potatoes for 5 minutes and add them to the stew and cook 15 minutes. Add seasoning. If the stew is not thick enough, add a little thickening of flour and water and boil it 5 minutes longer. (Class work as a unit.)

2. Lamb Stew with Dumplings

2 lbs. lamb (shoulder)	1 c. tomato
3 c. boiling water	2 small potatoes
1 small onion	2 tbsp. rice

Salt and pepper to taste

Method.—The same as for beef stew. Add the washed rice when meat has cooked 1 hour. Parboil the potatoes, add them to the stew and cook 20 minutes longer. Add the strained tomato 10 minutes after the potatoes are put in. Add the seasoning. The tomato may be omitted and boiling water used in its place.

Dumplings for Lamb Stew

2 c. flour	½ tsp. salt
4 tsp. baking powder	¾ c. milk

Method.—Mix and sift the dry ingredients, add the milk slowly until a smooth drop-batter is formed. Drop by the spoonful into the boiling stew on top of the potatoes and meat. Cover closely to keep in the steam, and cook 10 minutes without lifting the cover. Take out the dumplings, which should be light and fluffy, put the meat and vegetables in the center of a hot platter, and the dumplings around the edge. Dumplings may be dropped into a steamer and steamed over the hot stew or over a kettle of boiling water.

(*Basis for* 2 *girls,* ¼ *rule and* 2*c. stew.*)

3. Breaded Veal Steak

Method.—Wipe, trim off superfluous fat, sprinkle with salt and pepper, dip in crumbs, in egg, and then again in crumbs, and sauté, or fry, until well browned. Be careful in turning not to shake off the crumbs. Cover closely and continue cooking over a low fire until thoroughly cooked and tender (15 to 20 minutes). Veal cutlets and chops may be cooked in the same way or in deep fat

(*Basis for* 2 *girls,* 1 *chop or cutlet.*)

4. Veal Birds

Method.—Select slices of veal from the leg, cut as thinly as possible, remove bone, skin, and fat. Cut in pieces 2½ inches long by 1½ inches wide, each piece making a bird.

Chop trimmings of veal and a small piece of fat salt pork, and add one half their measure of finely crushed crackers. Season with pepper, cayenne, poultry seasoning, lemon juice, and onion juice. Moisten with beaten egg and water. Spread each piece with a thin layer of stuffing, taking care not to have the mixture come too close to the edge. Roll, and fasten with skewers or toothpicks. Sprinkle with salt and pepper, dredge with flour, and sauté in hot butter until a golden brown. Put in a casserole, add rich milk to half cover meat, cover and cook slowly in the oven until tender. Serve on small pieces of toast and garnish with parsley.

5. Swiss Steak

1 lb. round steak	2 tbsp. fat
¾ c. flour	½ c. water
½ tsp. salt	Pepper

Method.—Pound the flour into the meat first on one side and then turn and pound it into the other side, using a steak hammer or the edge of a heavy saucer. Melt the fat in a pan, then add the steak and brown it on both sides. Add the seasonings and the water, cover the pan, set in the oven, and cook at moderate temperature for 2 hours. If the meat becomes dry, add more water and baste it. Serve on a platter with the gravy in the pan.

HOME PROJECTS

1. Compile a price list of cuts of tough meats and of tender meats per pound existing in your meat market.
2. Prepare meat for one dinner using one of the tougher cuts.
3. Plan and prepare the vegetables to serve with that meat.

LESSON 46

MEAT

Cooking Tough Ground Meat and Left-Overs

Tough cuts of meat may be ground in a food chopper and cooked in a number of different pleasing ways to give variety to meats and at the same time lessen the cost of the food. The same principle of cooking large pieces of the tougher cuts applies to that of cooking the meat when it is ground, that is, a moderate, moist heat. The moisture is usually supplied by adding meat broth or stock, eggs, tomato sauce or water. If the meat is raw when ground, it requires nearly the same time for cooking as when it is not ground. If the meat has been cooked tender by a former method of cooking or is a left-over ground up, it needs to be only heated through in the next cooking process.

Ground raw meat and left-overs are utilized in various ways which include meat cakes, loaf, hash, casserole dishes, croquettes and a chartreuse.

Meat cakes are made from ground raw meat well seasoned and moistened with a little water or meat stock or slightly beaten egg, then shaped in cakes 1 to 1¼ inches thick, and pan broiled, sautéd, or braised.

Meat loaf is made from the same sort of ground mixture as meat cakes, but is pressed into a deep pan and baked in the oven. Usually a combination of two meats is used in a meat loaf, such as beef and salt pork or veal and pork, in order to add more fat to the loaf and to give it additional flavor.

Hash is made from ground cooked meat with or without the addition of potatoes, and the mixture is sautéd in a frying pan until brown. Hash may be baked in the oven.

Casserole cooking lends itself remarkably well to the use of left-overs of meat, and makes the cooking and serving a

very simple attractive method. The ground cooked-over portions of meat usually require additional moisture to make them juicy and appetizing. Meat stock or gravies left over from roasts, stews, and soups should be added to the ground meat in the casserole. Tomatoes, potatoes, rice, and many other food additions may be used to vary the flavor and kind of dish. Casserole dishes require a moderate oven for just sufficient time to heat the contents and blend the flavors.

Croquettes.—See Lesson 26.

A chartreuse is a mold of finely cut meat and vegetables, with a meat stock foundation, or a mold of fruits with a gelatin foundation.

Meat Accompaniments.—Most dishes prepared from ground tough cuts of meat and left-overs are improved in flavor and appearance in serving by a sauce or some accompaniment. Meat accompaniments may be either hot or cold. Hot accompaniments include meat sauces, tomato sauce, mushroom sauce, or vegetables. Cold accompaniments include relishes, jellies, spiced conserves, or glacéd apples.

QUESTIONS AND PROBLEMS

1. Which way of utilizing left-over meat is the most attractive?
2. Which has the best flavor?
3. Which is the most easily digested?
4. How can you cut up left-overs if you have no food chopper?
5. What are the most commonly used flavorings for meat loaf?

1. Hamburg Steak

Method.—Chop fine some raw lean beef, season with salt and pepper, shape in small flat cakes, panbroil in a hot frying pan. A few drops of onion juice or onion cut fine may be added, and also one egg slightly beaten. In forming the cakes, handle as little as possible. Cakes that are pressed too compact will be hard and solid.

(*Basis for 2 girls, ⅓ c. chopped meat.*)

2. Browned Hash

2 c. chopped cold roast beef	2 c. chopped cold corn beef
2 c. cold boiled potatoes	2 tbsp. hot milk
Few drops of onion juice	Salt and pepper to taste

Method.—Mix ingredients thoroughly. Put into a frying pan 2 tbsp. of beef fat or butter. Spread the meat mixture in the frying pan and cook, without stirring, over a moderate fire about 30 minutes. When brown underneath, fold like an omelet and place on a hot platter.

3. Meat Loaf

2 lbs. beef (cut from the round)	1 tsp. onion juice
1 tsp. salt	¼ tsp. pepper
1 beaten egg	½ c. milk
1 tbsp. chopped parsley	2-inch cube salt pork fat

1 c. bread crumbs

Method.—Wipe the meat with a damp cloth and put through a meat chopper with the pork. Add seasoning, mix well, add the crumbs, well-beaten egg, and the milk gradually. Place in a well-greased pan. Put small pieces of butter or strips of bacon on top. Bake 40 minutes in a moderate oven. Baste every 10 minutes with 1 tbsp. of butter melted in 1 c. of boiling water.

Strips of pimiento and hard-boiled eggs placed in the center of the loaf add a pleasing garnish to the loaf when sliced.

4. Chartreuse of Rice and Meat or Fish

1 c. rice	1 pt. cold meat or fish
2 qts. boiling water	1 c. tomato sauce
1 c. stock	1 egg

Method.—Cook the rice in the boiling water till tender. Drain and line a mold about ½ inch deep. Beat the egg slightly and mix with the finely cut meat or fish, then add the stock. Fill the center of the mold with the meat mixture, cover the top with rice and steam 30 minutes. Turn from the mold and serve with Tomato Sauce.

Boiled hominy or mashed potato may be used in place of the rice.

5. Veal Loaf

2½ lbs. veal	⅓ c. catsup
½ lb. salt pork	1 c. cracker crumbs
4 eggs	Cayenne, salt, pepper
Juice of small lemon	Bit of butter

Method.—Mix ingredients thoroughly and shape into a loaf, placing butter on top. Bake 2 hours in covered pan, May be served with a border of peas.

6. Mushroom Sauce

1 c. mushrooms	¼ c. flour
1 c. mushroom liquor	1 c. chicken stock
¼ c. butter	Salt and pepper

1 tbsp. lemon juice or French dressing

Method.—Drain and rinse the mushrooms and chop fine one half of them. Cook 5 minutes with butter and lemon juice; drain. Make brown sauce of butter, flour, and soup stock and mushroom liquor according to Method 1 for White Sauce. Cook 10 to 15 minutes, add remaining mushrooms, cut in quarters or slices, and cook 2 minutes. Use fresh mushrooms in preference to canned ones.

Mushrooms become tough if handled much; they require only a few minutes to cook.

(*Basis for 2 girls, ¼ rule.*)

HOME PROJECTS

1. Prepare a meat for one dinner, using one of the recipes given under this application.
2. Compare the cost of meat for this dinner with that of your steak dinner last week.
3. Do the marketing for your vegetables this week.

LESSON 47

MEAT

Extracting Juices and Stock Soups

Meat Soups.—Soups that have meat as their basis are called stock soups. The stock is the essential element which gives its flavor and nutritive value and is the liquid in which the meat and bone were cooked. It contains all the soluble parts which have been extracted. The stock thickens, when cold, on account of the extracted gelatin from the bones and connective tissue. The thickness of the stock varies according to the quantity of bone used and the manner in which it was cooked. The use of much bone makes a thicker stock, when cold, and slow cooking at a temperature no higher than simmering point is necessary for the extraction of the gelatin. Too high a temperature breaks down the thickening property of gelatin, just as too long boiling breaks down the thickening property of the pectin in making jelly.

Kinds of stock soups are:—

1. *Bouillon* is made from beef stock, delicately seasoned.
2. *Brown soup stock* is made from beef and is highly seasoned with vegetables and sweet herbs.
3. *White soup stock* is made of chicken or veal, delicately seasoned.
4. *Consommé* is made of several kinds of meat (beef, veal, fowl), highly seasoned with vegetables and cleared.

Food Value.—Meat soups contain very little nutriment, but have a strong meat flavor, due to the extractives. They stimulate the flow of the digestive juices, warm the stomach, and prepare it for solid food.

The dissolved albumin of the muscle fiber which is drawn out in the stock appears as a scum on the top of the liquor when it is simmering and forms the settlings when the stock is cold. When soup is served clear, all this protein is re-

moved, so that there is no protein for food value other than gelatin in cleared meat soups.

Proportions of ingredients for soup stock are: Use ⅔ lean meat to ⅓ bone and fat, and 1 quart of water to each pound of meat and bone.

Meats for Soups.—The much-used muscles of meat contain more juice; the hard connective tissue is softened by long, moderate cooking. Select meat from the legs or neck. Use left-overs from roasts and steaks to add to the flavor, and utilize all other scraps.

The bones and scraps left from cooked chicken should be added to the soup kettle or used for chicken stock.

Any of the following may be used as seasoning for soups: vegetables, cereals, herbs, spices, and noodles.

Application of Heat for Soup Making.—In making meat soup it is necessary to draw out as much of the extractives, mineral matter, and proteins as possible, if the stock is to be well flavored and nutritious. In order to do so, the larger the surface which is exposed to the water the greater the ease of extraction. Meat, cut into small pieces 1½ to 2 inches in size, is placed in cold or tepid water deep enough to cover, and let stand until the water shows by its color that some of the extractives and meat juices are drawn out.

Long moderate cooking is necessary and plenty of water to soften the connective tissues and dissolve the protein in the bones. Browning meat gives it a rich flavor, and the addition of a small quantity of brown meat to the water in the soup kettle improves the flavor of the stock. Only a small portion of meat for soup should be browned, if the juices are to extracted.

Directions for Soup Making.—Observe the following:—

1. Use all trimmings from roasts and steaks with soup meat.

2. Cut up meat in small pieces. Break the bones, so that the juice may escape easily.

3. To give color and flavor to the soup, sear a small amount of the meat in a frying pan until brown.

4. Put meat, bone, and fat in cold water. Soak for half an hour until the water is red. Cold water draws out the juices.

5. Simmer 5 to 6 hours, never allowing temperature to reach the boiling point. Boiling toughens the albumin and does not permit the flow of juices. Clean and cut up vegetables and add at the last hour of cooking.

6. When done, strain out the meat and vegetables. Put into several small jars, so that the entire amount is not disturbed each time some is used.

7. Cool quickly, and keep in cold place. Keep a layer of fat on top of stock to exclude air. Remove the fat from the soup stock before making soup.

QUESTIONS AND PROBLEMS

1. What cuts of beef would be best for making soup?
2. What would you ask for in the market?
3. What does soup meat cost a pound?
4. What is the difference in application of heat in boiling and soup making?
5. Are clear soups as nutritious as soup stock before clearing?
6. When would you serve a cream soup?
7. Could meat stock be used in making White Sauce for Cream Soup or for a Cream Sauce to be served with meat? How?
8. Why is it necessary to exclude air from the top of meat stock?
9. Why is egg white used to clear soup?

REVIEW MEAT COOKERY

APPLICATION (Extracting juices)

1. Brown Soup Stock

4 lbs. beef shin
2 qts. cold water
½ tsp pepper
Carrot, Turnip, Onion, Celery — one-half c. each cut in dice
6 cloves
½ bay leaf
2 sprigs parsley
1 tsp. salt

Method.—Wipe beef, and cut the lean meat in small pieces. Brown a third of it in a hot frying pan in marrow from a marrow bone. Put remaining two thirds with bone and fat in soup kettle, add cold water, and let stand for ½ hour. Place on back of range, add browned meat, and heat gradually to boiling point. As the scum rises, it should be removed. Cover and cook slowly 6 hours at a temperature below the boiling point. Add vegetables and seasonings, cook 1½ hours longer, strain, and cool as quickly as possible. A few tablespoonfuls of dried vegetables may be substituted for fresh vegetables to give flavor if fresh ones are not available.

2. Bouillon

Method.—Bouillon is made from Brown Soup Stock by removing the cake of fat, and clearing. It is served clear in bouillon cups.

To Clear Soups.—Put stock over fire, and add a slightly beaten egg white with the shell. Stir, let boil 2 or 3 minutes, and then simmer 10 to 15 minutes. The albumen of the egg coagulates and entangles the particles of meat and vegetables as in a net. Remove the scum, and strain the soup through a cloth or finer strainer. Serve clear.

3. Vegetable Soup

Method.—To 1 qt. of stock, add 3 tbsp. each of celery and turnip, either chopped or cut with vegetable cutter; 1 tbsp. of carrot; and 1 c. of cooked and strained tomato, and a little fried onion; or omit the tomato and onion and add small green peas, cauliflower, asparagus tips, or all three.

4. Noodle Soup

Method.—To 1 qt. of stock add ¼ c. of noodles. Macaroni, vermicelli, rice, or barley may be added to the stock for variation.

Serve with soup: croutons, toasted crackers, or cheese balls.

HOME PROJECTS

1. Prepare soup stock or chicken soup at home during the week.
2. Market for the meats used at home during the week.
3. Watch the cutting of the meat in the market, and learn to distinguish different cuts, and be able to give the price of each cut.

LESSON 48

GELATIN—GELATIN JELLIES

Source and Manufacture.—When the bones, connective tissue, hoofs, skin, etc., of animals are cooked a long time, much of the material becomes a jelly, and is called gelatin. Scraps of hide, horns, etc., are used in the same way to make glue, which is a crude form of gelatin. The purest and best gelatin is made from the air bladders of fish, especially sturgeon, and is called isinglass. There are also vegetable gelatins made from different sea plants.

Appearance.—Gelatin is transparent and tasteless. Commercial gelatin is sold in granulated form.

Food Value.—Although gelatin contains nitrogen, it is an incomplete protein, since it does not contain the amino acids necessary for promoting growth. The body uses it to produce energy, and as such it is sometimes called a protein sparer, i. e., it saves protein for tissue-building that might otherwise be consumed for heat and energy. It is one of the most easily digested of foods, and for this reason is very suitable to serve to the sick and convalescent.

When gelatin is used in making gelatin jellies, it is combined with some fruit juice to give it flavor, but contains very little nutriment. When egg whites, fruit, meat, or whipped cream are blended with the jelly, some nutriment is added as well as flavor.

EXPERIMENTS

Effects of Hot and Cold Water on Gelatin

1. Put 1 tsp. gelatin in 1 tbsp. cold water.
2. Put 1 tsp. gelatin in 1 tbsp. boiling water. Let stand a few minutes, then compare the results.
3. Add ¼ c. boiling water to the cold water mixture. Stir it, and see what happens. Compare with the mixture in experiment 2.
4. From these experiments determine the best method of dissolving gelatin for jelly.

Effects of water on gelatin:—

1. Gelatin does not dissolve in cold water; it only softens and swells.

2. Gelatin dissolves in boiling water.

3. Dissolved gelatin gets thick when cool. A solution as weak as 1 per cent will set.

4. Gelatin will not thicken if boiled before cooling.

Directions for the preparation of gelatin:—

1. The ordinary proportion is 1 ounce of gelatin to about 1 quart of liquid. In hot weather more is required. As served, the jelly does not usually contain over 3 per cent of gelatin. A 2-oz. box holds 5 tablespoonfuls. Too much gelatin makes the jelly taste of it.

2. When gelatin is well soaked, dissolve with boiling water, but do not boil or stir much.

3. If fruit is used, more gelatin is needed.

4. Add sugar to gelatin while the water is hot, to dissolve the sugar.

5. Add flavoring and fruit juice after the gelatin is dissolved.

6. Strain through a wet cloth or a fine strainer into a wet mold.

7. Put on ice or in a pan of ice water to stiffen. This process takes from 2 to 5 hours.

8. To vary the flavor and color, use different flavors; as, cinnamon, fruit, meat; or a good coloring, *sparingly*.

9. To make jelly and fruit in layers, put a part of the gelatin with fruit into the mold, let stiffen, keeping remainder warm in a pitcher set in warm water. Then make a second layer, and repeat until all the gelatin is used.

10. Individual molds of jelly may be made in the same manner, or a large mold having a hollow stem may be used. The center is filled with whipped cream for serving.

11. To remove jelly from the mold, dip mold into, and immediately out of, hot water. Turn upon a serving dish.

QUESTIONS AND PROBLEMS

1. Why is gelatin an incomplete protein?
2. What must be done to gelatin before boiling water is added?
3. How many tablespoonfuls of gelatin are there in one box?
4. How many tablespoonfuls of gelatin in one ounce?
5. What is the name of the protein from which gelatin is derived?
6. Why do gelatin jellies make a good dish for convalescents?
7. What other dishes contain gelatin?
8. What other foods should be used in the same meal with the gelatin dessert?

APPLICATION

1. Lemon Jelly (Standard Rule)

1½ tbsp. granulated gelatin	Spk. salt
¼ c. cold water	¾ c. sugar
1½ c. boiling water	⅛ c. lemon juice

Method.—Soak gelatin in cold water to soften (about 5 minutes). Add the boiling water and the sugar and stir until dissolved. Add the flavoring or fruit juice. Strain through a wet cheesecloth or fine strainer into a cold, wet mold. Let stand in a pan of ice water to stiffen.

(*Basis for* 2 *girls,* ¼ *rule.*)

VARIATIONS OF LEMON JELLY

Fruit Jelly

Method.—Add fruit (oranges, bananas, marshmallows, white grapes, etc.). Cut the fruit into uniform-size pieces. Arrange a layer in the bottom of the pan, and add ½ the dissolved gelatin. Let stand until firm, keeping the remainder of the gelatin in a warm place, so it will not thicken. Then add the other layer of fruit to the gelatin in the pan, and the remainder of the gelatin to cover for another layer. Set away until jelly is firm. Serve turned out of mold on a glass serving dish with or without whipped cream.

Any fresh or canned fruit which does not contain too much water may be used. Fresh pineapple can not be used, since it contains a substance, or enzyme, which breaks down the thickening property of gelatin, causing a thin watery jelly that will not thicken. Canned pineapple does not have any such effect upon gelatin.

Orange Jelly

2 tbsp. granulated gelatin	⅔ c. sugar
¼ c. cold water	Spk. salt
1½ c. boiling water	½ c. orange juice
	2 tbsp. lemon juice

Method.—Make the same as Lemon Jelly, but use ½ c. orange juice with 2 tbsp. of lemon juice instead of all lemon juice and reduce sugar to ⅔ c.

Snow Pudding

Method.—Use the Lemon Jelly rule. Beat whites of 3 eggs until stiff and dry, and, when the jelly begins to thicken, add the beaten whites. Beat until the jelly is stiff and nearly firm; then pour it into a cold, wet mold or into custard cups. Serve with *soft custard* made from—

2 c. scalded milk	4 tbsp. sugar
2 eggs (yolks)	Spk. of salt
½ tsp. vanilla	

Method.—Beat yolks slightly, beating in the sugar and salt; add the hot milk, slowly stirring the mixture all the while. Pour into a double boiler and cook, stirring constantly, until the custard coats the spoon (about 5 minutes). Strain at once and add the vanilla.

2. Grape Jelly

2 tbsp. granulated gelatin	1 c. sugar
½ c. cold water	Juice of 2 lemons
1 pt. boiling water	1 c. grape juice

Method.—Soak the gelatin in cold water a few minutes, then add the boiling water and stir until dissolved. Add the lemon juice, sugar, and grape juice. Strain the mixture, pour into cold molds, and cool. When cold and firm, put the jelly through a potato ricer and serve in sherbet glasses with whipped cream.

3. Meat Jellies

Method.—Jellied veal or chicken is made by cooking the meat a long time, reducing the meat stock, removing the meat from the bone, and packing in a mold with the meat liquor. Enough gelatin is extracted to mold the meat without adding commercial gelatin.

HOME PROJECTS

1. Make a dessert using gelatin for Sunday night lunch.
2. Plan the rest of the meal to go with the dessert.
3. Continue the marketing for supplies for the home table.

LESSON 49

HOUSEHOLD EXPENDITURES

Budgets—Household Accounts

The home as we know it has grown out of a need of shelter for the family. The home-makers have always been women; the care of the home and the management of all household duties have always been in their hands.

Knowledge comes from study and practice, or in the actual doing. Every man spends several months or years in preparation for the business or trade he intends to enter. So every girl should spend time and study in fitting herself for her life work.

It has been estimated that 95 per cent of the girls eventually take their place in the home. So it seems necessary to include in the education of every girl some study and practice in home management, if her home is to be conducted in a business-like manner.

Good home management includes the selection and care of all material used in the continuance of the home—the food, its preparation and service; the care of children; the management of servants; and the keeping of accurate household accounts.

One of the most important features of good home management is system. With a system each day and week has its special duties to be performed, and each member of the household knows for what he or she is responsible.

The home-maker must be thoughtful, have a good sense of values, and exercise good judgment in expenditures. She must be interested in her home and willing to help others.

Servants.—Servants need wise supervision and are only too quick to recognize the worth of an employer. The woman who is able to retain good help exercises good judgment in the manner in which she treats her servants.

Commending servants for things well done and refraining

from nagging or reprimanding them before others will result in better work and greater effort to please.

A wage scale for help by which the wages increase at stated times or on the merit system will effect an improvement in retaining efficient help. Servants are as ambitious as any other class of workers and move from one place to another in the hope of bettering themselves.

Factors Influencing Cost of Living.—The same income for two families of the same size would never be utilized in the same way or the proportionment of expenditures be anywhere near the same.

So many factors influence the living costs. What one family would have to deal with in their living problem might not affect another family and they in turn might have other problems to meet which would influence their plan of expenditures.

The principal factors which have a direct bearing on the family income and the way it is spent includes:—

1. The number in the family.
2. The ages of the members of the family.
3. The standard of living, which calls for a difference in the scheme of education and the manner of living.
4. The tastes for amusements and cultural life.
5. The occupation of adults which would necessitate a great difference in kind of clothing and the keeping up of general appearances.
6. The locality, city or country which makes a difference in market condition, cost of food and the proximity to the source of the supply of food.
7. The future plans of the family and ideals which all families should have.

Household accounts, such as the average person keeps of the daily and weekly expenditures, are a waste of time and of little real service in establishing a system of saving.

Many persons spend several minutes every night trying to

locate a five or ten cent shortage without realizing that it makes no difference where the money was spent, if all the expenditures are necessary ones, and that they are wasting valuable time in searching for the insignificant item.

The average account is nothing more than setting down the exact figures of expenditures for each item of food, carefare, clothing, etc. It may prove interesting to know where the dollar was spent, but it does not give any help in knowing how to spend the next dollar any more wisely.

Budget System.—The really helpful plan of household accounts is the one which looks ahead to future expenditures instead of counting up past ones.

City and State governments, school authorities, and most big business houses have what it called a budget system. This includes a definite sum set aside for each item of expenditure during the coming year. The amount of these sums is devised by a study of past needs together with the needs for the future. By this plan each department knows definitely what money it has for its operating needs and must keep within that amount.

The budget system for the family is just as important as it is for big business.

Where a definite income is assured the family expenses should be proportioned to the various items. If for any reason the allowance for one department of the household exceeds one month that of the budget plan for it, it should be balanced in the next month or two months so as to keep within the total annual allowance.

Budgets are made for a year's expenditure, instead of for each day, week, or month.

The budget should be made up of the following items:—

Housing conditions, including rent, upkeep of own property, interest, taxes, insurance, and all resulting expenses.

Operating expenses, including light, heat, telephone, water, furnishings, repair, and help employed.

Food, including meals at home and those purchased elsewhere, or carried in lunch, groceries, meat, milk, etc.

Clothing, including new clothing and repairs on old for all members of the family, dry cleaning, pressing, etc.

Non-essentials or luxuries, including personal service of hair, face, and hands, parties, candy, amusements, club memberships, etc.

Savings, including insurances, bank moneys, investments in securities, monthly payments on property when purchased on installment plan, yearly dues for fraternal organizations.

Higher life and advancement, including education, books, periodicals, music, contributions to church, charity, club, and physical condition, which includes all medical service.

The amounts of expenditure for each item must be decided by each family. The budget of some other family or some friend will not fit other conditions, and it is only by careful planning, wise supervision, and management that the budget best adapted to the case can be worked out.

The proportion of money spent for the necessary items of food, housing conditions, operating expenses, and clothing is greater with the small income than with the large income, and varies with the increase in income. For example, the low income has a high per cent spent for food, and the high income a proportionately low per cent. The low income has a low per cent spent for advancement, savings, etc., and the high income has a proportionately high per cent.

Per Capita Allowances for Food.—A minimum allowance for food per day for each member of the family has been generally estimated to be approximately 35¢, with 75¢ a high average, and $1.00 a day an allowance permitting many luxuries and a great variety of fresh fruits and vegetables in the diet. This, of course, must be determined by the individual case and income.

A simple home system of accounts may be used with the

budget plan as an aid to check the expenditures by the month, and strike a balance. This account then will be useful in forming the budget and proportioning the allowance for each item for the following year.

The system used should be simple and easy to keep and be accurately kept.

A sample page of a simple system is here given:—

HOUSEHOLD ACCOUNTS

Month of..... Year.....

Items of Expenditures	Amounts	Totals
Food		
Meat		
Milk and cream		
Groceries		
.....	.....	.....Total Food
Shelter		
Rent		
Insurance		
Taxes		
Repairs		
.....	.....	.....Total Shelter
Clothing		
.....	.....	
.....	.....	.....Total Clothing
Operating Expenses		
Fuel		
Light		
Gas		
Ice		
Telephone		
Help		
.....	.....	.....Total Operating
Education and Amusement		
School		
Papers, books, etc.		
Traveling		
.....	.....	.....Total Ed. & Amus.

Benevolence		
Church		
Club dues		
Charity		
		Total Benevolence
Personal Accounts		
		Total Pers. Accts.
Emergencies		
Doctor		
Dentist		
Medicines		Total Emergencies
Incidentals		
		Total Incidentals
		Total Expenses
Income		
Balance (loss or savings)		

The monthly statements may be carried forward each month, showing the balance; or a yearly summary may be drawn on a separate page, showing the expenditure totals and the complete credits or debits at the end of the year.

Whatever the system employed in keeping the household accounts, it should show: (1) The total income or cash received, (2) the total expenditures, (3) how the money was spent, and (4) the balance—savings or losses.

Children should be taught to keep their own personal accounts for each week or month, and be made responsible for an allowance, however small.

QUESTIONS AND PROBLEMS

1. What household duties do you do each week?
2. What is a budget?
3. Why are budgets of use in the home?
4. Do household accounts take the place of budgets?
5. What are the factors influencing the expenditure of money?
6. What main items are used for a division of accounts?
7. Why should one try to save a part of the income?

APPLICATION

1. Work out a suggestive outline of household duties and plan for a week's work in your home.
2. Assign the duties of one maid.
3. Make out a household account record page for one month, using a typical family of four, including two children.
4. Make out a budget for the same family for 1 year.
5. Make out your own personal account for the past month.

HOME PROJECT

1. Find out as near as you can the proportion of money spent in your home per capita for food.
2. Then plan the meals for a week and estimate the cost to see whether you can keep within the allowance.
3. Prepare some food every week.

LESSON 50

FOODS FOR ADULTS

Daily Requirement—100-Calorie Portions

During the first twenty-five years of life the body is growing and gaining in weight and size. During that time the choice of food must include foods which will build new body tissues and repair the worn-out tissues and also produce the necessary fuel to furnish sufficient energy for the body activities. After the body has attained its full growth it requires food in sufficient quantity to maintain a fairly constant weight and serve the energy needs.

Normal persons of similiar age and size are practically alike in their energy requirement when their activity and muscular work are the same. Two persons eating the same kind of a dietary each day with a difference in activity will necessarily soon become different in weight, since the energy requirements of one may not utilize all the food eaten and it will become stored in the body as fat. The best indication as to whether the quantity of food habitually eaten is correct and properly adjusted to the work of the body is by the store of body fat a person has.

For guidance in the selection of food, nature provides us with instinct and taste, but we are apt to be influenced too much by taste and to overlook instinct and experience. We need also to acquire the knowledge of foods that science has made possible through the laboratory. When more food is eaten than is needed, the digestive organs are overtaxed or injured and much is wasted which might have been used to better account.

Food Requirements for Different Conditions.—Proportions vary greatly in the amount of nutrients required by persons of various age, sex, and activity. A young child needs less food than an older one, a man more than a woman,

a tall thin person more than a short fat one, and all require more when at work than when at rest. The following table shows the comparative food requirements of persons of different ages and occupations as compared with the needs of a man in full vigor at moderate work.

Proportionate Food Requirements for Different Conditions

Man, full vigor, at moderate work	100
Man, full vigor, at hard work	120
Man, full vigor, at sedentary work	80
Woman, full vigor, at moderate work	80
Woman, full vigor, at hard labor	100
Woman, full vigor, at sedentary labor	70
Man or woman, old age	90
Man or woman, extreme old age	70 to 80
Boy, 15-16 years old	90
Boy, 13-14 years old	80
Boy, 12-13 years old	70
Boy, 10-11 years old	60
Girl, 15-16 years old	80
Girl, 13-14 years old	70
Girl, 10-12 years old	60
Child, 6- 9 years old	50
Child, 2- 5 years old	40
Child, under 2 years old	30

These figures illustrate the fact that there is an increase in food consumption from infancy until full vigor and that there is a decrease in old age. They also show that the amount of muscular work performed greatly affects the food requirements. Climate and season are other factors to be considered. In winter the energy requirement per day is greater by about 800 Calories than in summer.

Heat Value of Food.—*A Calorie** is the unit of measure in determining quantity of heat. It is used in designating the fuel value of a food, or the amount of heat that a given quantity of the food will produce in the body.

1 pound of protein yields 1,820 Calories.

1 pound of carbohydrates yeields 1,820 Calories.

1 pound of fat yields 4,084 Calories, or 2¼ times as many Calories as carbohydrates.

*The heat necessary to raise the temperature of 1 pound of water 4°F. equals 1 calorie.

Standard Requirements a Day.—Since protein foods are indispensable in the building of muscular tissue, fats and carbohydrates should be supplied in the right proportion and quantity, so that the proteins will not be utilized as fuel. Fats and carbohydrates are more abundant and cheaper foods for fuel, and when oxidized leave waste substances that are easily eliminated from the body. Protein consumed for energy leaves a nitrogenous waste which necessitates additional work on the part of the excretory organs.

The approximate energy requirement of an average size man:

When sleeping, is .4 Calorie per pound per hour.

When sitting, .6 Calorie per pound per hour.

At moderate exercise 1.0 Calorie per pound per hour.

At active exercise 2.0 Calories per pound per hour.

At severe exercise 3.0 Calories per pound per hour.

It is easy, therefore, to compute the energy requirement of anyone, if the weight is known and the number of hours of sleep and the hours of different kinds of exercise are given. For example, a man weighing 165 lbs. at work in an office would require the following number of Calories:—

8 hours sleeping, 165 x .4 x 8—528 Calories

12 hours sitting, 165 x .6 x 12—1,188 Calories

4 hours moderate exercise, 165 x 1.0 x 4—660 Calories

Total Calories per day—2,376.

The standard requirement per day has been estimated as follows:—

Man at light work.....2,450 to 2,800 Calories
Man at moderate muscular work.....2,800 to 3,150 Calories
Man at hard muscular work.....3,150 to 4,200 Calories
Man at rest.....2,100 to 2,450 Calories
A woman, .8 as much as a man

Proportion of Foodstuffs.—A diet, moderate in the amount of protein but consisting of plenty of fuel foods, is much the best for growth. Ten to fifteen Calories in every hundred is sufficient to be derived from protein. A family

requiring 12,000 Calories per day should have 1,200 as the protein Calories. The kind of protein food to be selected is also of great importance. The protein material should be varied in order to secure the different kinds needed for maintenance, growth, and activity. Less meat should be used and the protein supplied by such foods as eggs, cheese, legumes, and whole wheat breads and cereals. Milk, being rich in calcium, is very essential to the growing child and should be used freely in the diet. The carbohydrate and fat requirement is usually provided for in a dietary consisting of a varied diet which contains the necessary protein requirement and the total number of Calories required.

Some food rich in vitamines should be included in each meal.

The nutritive ratio of foods is the proper ratio in which digestible protein should be taken in relation to the digestible fats and carbohydrates, so as to secure a diet which will produce the greatest efficiency at the least cost and waste. The nutritive ratio has been estimated by Atwater to be 1:6½, or 1 part protein to 6½ parts carbohydrates. The best proportion of fat to carbohydrates is 1:2½; that is, 2½ times as much carbohydrates as fat.

Ash Constituents.—In addition to the consideration of the number of Calories supplied the body by the proteins, carbohydrates, and fats, the ash requirement is important in planning the dietary.

The ash which exists in the body consists mainly of phosphorus, iron, calcium, potassium, sodium, sulphur, magnesium, and chlorine. All these mineral substances are necessary for the proper growth of the body, although no definite proportion of ash in the diet is required; but ash supplying foods must be freely used.

The following list of foods rich in ash material is given as an aid in menu planning.

PRINCIPAL ASH CONSTITUENTS OF FOODS

In the approximate order of their proportions

Iron	*Calcium*	*Phosphorus*
Fruits		
Strawberries	Strawberries	Raspberries
Grapes	Lemons	Strawberries
Lemons	Oranges	Grapes
Dates	Raspberries	Peaches
Raisins	Figs	Figs
Figs		Currants
Prunes		Cherries
Vegetables		
Spinach	Cauliflower	Spinach
Lettuce	Celery	Celery
Asparagus	Spinach	Lettuce
Beans—string	Lettuce	Cauliflower
Cabbage	Rhubarb	Cucumbers
Celery	Turnips	Asparagus
Radishes	Cabbage	Rhubarb
Peas	Beans—string	Radishes
Carrots	Asparagus	Turnips
Potatoes	Radishes	Parsnips
Nuts		
Peanuts	Almonds	Peanuts
Chestnuts		Almonds
		Walnuts
Cereals		
Wheat flour, Graham	Oatmeal	Wheat flour, Grah'm
Oatmeal	Bread, Graham	Rye flour
Bread—Whole wheat	Bread—Whole wheat	Oatmeal
Wheat flour—white	Bread—white	Bread—whole wheat
Barley, pearled		Barley, pearled
Meats		
Beef, lean	Frog's flesh	Frog's flesh
Ham	Veal, lean	Beef, lean
	Beef, lean	Veal, lean
	Chicken	Chicken
Fish		Ham
Salmon		
Cod	Pike	Cod
Halibut	Herring	Pike
	Haddock	Haddock
Dairy Products		
Milk	Buttermilk	Buttermilk
	Cheese	Cheese
	Milk	Milk
Eggs		
Yolk	Yolk	Yolk
Whole	Whole	Whole

From these tables various diets may also be arranged depending upon the particular case or the patient. For example, the anaemic patient would have a diet selected mainly from the foods containing iron and blood-forming properties such as the following type of meal:—

Menu

Spinach Soup — Crackers

Beefsteak

Creamed Carrots — Graham Bread and Butter

Lettuce Salad

Prune Whip — Oatmeal Cookies

100-Calorie Portions.—In order to obtain a working basis for the comparison of foods in menu making, a common unit of foods is necessary. For this purpose the Standard Portion, which is the amount of each food which yields 100 Calories of energy in the body has been established.

For the proper working out of dietaries it is best to know what the standard portions, or 100-Calorie portions, of many of the common foods are. Balanced meals come logically and easily when one thinks in 100-Calorie portions, as, for example, 100 Calories as one banana, or $\frac{5}{8}$ glass of milk, etc., instead of 100 Calories of banana as 5 ounces.

Or a person wishing to reduce the weight and amount of adipose tissue should use the following foods as given in first column in place of those which are fat-building foods such as given in the second column:

Sweet potatoes	instead of	Irish potatoes.
Graham bread	"	White bread.
Dry toast		Without butter.
Green vegetables	"	Starchy vegetables.
Green vegetable salads.	"	Heavy rich salads.
Vinegar dressing	"	Mayonnaise.
Lamb chops	"	Pork.
Stock soups	"	Cream soups.
Fresh fruits	"	Pastry and whipped cream desserts.
Plain cookies	"	Rich cake, doughnuts.
Oranges	"	Candy, nuts.
Clear coffee	"	Without cream, sugar.

TABLE OF APPROXIMATE 100-CALORIE PORTIONS

Foods	100 Calories Approx. Meas.	Wt. in oz.	Approx. No. of Cal. from protein	Cost to be worked out by students
Berries				
Blackberries	½ c.	6	9	.....
Blueberries	⅓ c.	4	3	.....
Cranberries	⅝ c.	7.5	3	.....
Currants	½ c.	6	10	.....
Strawberries	¾ c.	9	10	.....
Beverages				
Cocoa	2½ tbsp.	.7	17	.....
Chocolate	½ sq.	.5	8	.....
Breads				
Biscuits	1	2	14	.....
Boston brown	1 slice	1.5	9	.....
Graham bread	2 slices	1.5	14	.....
Graham crackers	2	.75	10	.....
Rolls	3	1.5	14	.....
Rye bread	1 large slice	1.5	14	.....
Soda crackers	2	.75	10	.....
Toast, white	2 small or 1 large	.8	10	.....
White bread	2 slices ½″ thick	1.5	14	.....
Whole wheat	2 slices	1.4	15.9	.....
Cake				
Chocolate layer	1 medium slice	1	7	.....
Cookies	2 medium	.75	6	.....
Doughnuts	½	.8	6	.....
Fruit cake	1 small slice	1	6	.....
Gingerbread	1 serving	1	6	.....
Macaroons	2	.8	6.1	.....
Sponge	2 pieces	1	6	.....
Cereals				
Cornmeal, uncooked	3 tbsp.	1	10	.....
Cornflakes	½ c.	1	10	.....
Cream of wheat	½ c.	1	10	.....
Hominy	3 tbsp.	1	9.2	.....
Macaroni, uncooked	4 sticks	1	15	.....
Rice, uncooked	2 tbsp.	1	9.2	.....
Rolled oats, uncooked	1 tbsp.	1	16	.....
Shredded wheat	1 biscuit	1	12	.....
Cheese				
American	1½ in. cubes	.75	25	.....
Cheddar	1½ in. cubes	.75	24	.....
Cottage	½ c.	3.25	76	.....
Swiss	1½ in. cubes	.8	25.5	.....

Foods	100 Calories Approx. Meas.	Wt. in oz.	Approx. No. of Cal. from protein	Cost to be worked out by students
Desserts				
Apple Pie	1/12 of pie	1.25	4.8	
Cornstarch pudding	½ c.	1.5	11	
Chocolate cornstarch	1 serving	1	15	
Custard pie	1/12 of pie	2	10	
Gelatin jelly	4 tbsp.	1	98.3	
Lemon pie	1/12 of pie	1.5	5.8	
Mince pie	1/16 of pie	1.2	8	
Plain ice cream	1 serving	1.75	10	
Pumpkin pie	1/12 of pie	1.2	8	
Eggs	2 small	2.3	36	
Fats				
Butter	1 tbsp.	.5		
Cotton seed	1 tbsp.	.5		
Lard	1 tbsp.	.5		
Oleomargerine	1 tbsp.	.5		
Olive oil	1 tbsp.	.5		
Fish				
Bass	1 serving	4	80	
Codfish	¼ c.	7	90	
Halibut steak	1 serving	3	61.2	
Herring, smoked	1 whole	1.25	54	
Lobster	1 serving	4.25	86	
Oysters	5 medium size	4.9	48.5	
Salmon	1 serving	1.5	38	
White fish	1 serving	2.3	58	
Flour				
Cornmeal	3 tbsp.	1	10	
Buckwheat	3 tbsp.	1	7.5	
Graham	3 tbsp.	1	15	
Rye	3 tbsp.	1	8	
Wheat	3 tbsp.	1	12	
Whole wheat	3 tbsp.	1	15	
Fruits				
Apples	2 medium	6	2.7	
Apples, dried	4	1.25	3	
Apricots, dried	2	6.2	7.8	
Bananas	1	3.5	5.1	
Berries, (see list)				
Dates	4	1.25	3	
Figs, dried	1	1.1	5.2	
Lemons	3	4	5	
Oranges	1 large	8	9	
Olives	7	1.4	2	

Foods	100 Calories Approx. Meas.	Wt. in oz.	Approx. No. of Cal. from protein	Cost to be worked out by students
FRUITS—(Continued)				
Peaches, fresh	2 medium size	8	6	.....
Peaches, canned	1 serving	7	6	.....
Pears	3	6.2	6	.....
Pineapple, fresh	5 slices	8.1	3	.....
Pineapple, canned	1 serving	2.25	4	.....
Prunes	4	1.25	3	.....
Raisins	2 tbsp.	1	3	.....
Rhubarb, cooked	3¼ c.	15	3	.....
Meats				
Bacon	1 slice	.5	.7	.....
Beef, corned	1 serving	1.5	21	.....
Beef, dried	4 slices	2	67	.....
Beef, round, lean	1 serving	2.25	60	.....
Beef roast	1 serving	2	43	.....
Beef sirloin	1 serving	1.5	31	.....
Beef porterhouse	1 small steak	1.3	33	.....
Beef rump roast	1 serving	1.5	40	.....
Chicken, young	1 serving	3.3	7.9	.....
Ham, fresh	1 serving	1.1	19	.....
Ham, smoked	1 serving	1.3	30	.....
Lamb, chops	1 small	1	24	.....
Lamb roast, leg	1 serving	1.5	38	.....
Pork, chops	1 small	1.4	21	.....
Pork, tenderloin	1 serving	1.75	39	.....
Pork sausage	1 small	.75	12	.....
Turkey	1 serving	1.2	27	.....
Veal, chops	1 chop	2.3	52	.....
Veal, roast	1 serving	2.3	50	.....
(All servings are of average size)				
Milk				
Buttermilk	1½ c.	9.8	32	.....
Condensed	1 c.	2	12	.....
Cream, 20%	¼ c.	1.75	5	.....
Skimmed milk	1 c.	9.5	36	.....
Whole milk	⅝ c.	5	19	.....
Nuts				
Almonds	1 doz.	.5	12.8	.....
Brazil nuts	¼ c.	.5	13	.....
Chestnuts	1 doz.	1.4	9	.....
Cocoanut, grated	2 tbsp.	.5	4	.....
Peanuts, shelled	1 tbsp.	.7	19	.....
Pecans	1 tbsp.	.5	10	.....
Walnuts	½ doz.	.5	10	.....

Foods	100 Calories Approx. Meas.	Wt. in oz.	Approx. No. of Cal. from protein	Cost to be worked out by students
Soups				
Celery	1 serving	6.4	15.3	.....
Corn	1 serving	3.2	12	.....
Pea	1 serving	7	27	.....
Cream of tomato	2 servings	9	15	.....
Vegetable	2 large servings	25.8	85	.....
Sugars, Sirups				
Loaf sugar	3 lumps	.9	0	.....
Granulated sugar	2 tbsp.	.9	0	.....
Powdered sugar	6 tsp.	.9	0	.....
Maple syrup	¾ c.	1	0	.....
Molasses	2 tbsp.	1.25	3	.....
Honey	2 tbsp.	1	.2	.....
Vegetables				
Asparagus, fresh	1 doz. stalks	7.5	18	.....
Beans, baked	⅓ c.	2.75	21.2	.....
Beans, dried	½ c.	1	25.5	.....
Beans, string	4 large servings	11.2	21.3	.....
Beans, lima	1 serving	4.5	21	.....
Cabbage	2 large servings	11.25	20	.....
Carrots	2	7.75	9.8	.....
Celery	1 bunch	19	24	.....
Corn, canned	1 serving	3.5	12	.....
Corn, green	1 ear	3.5	12	.....
Cucumbers	2	20.3	18	.....
Lettuce	2 large servings	18.5	24	.....
Onions	3 small	7.25	13	.....
Parsnips	1	5.25	10	.....
Peas, canned	2 servings	6.5	26	.....
Peas, fresh	1 large serving	3.5	28	.....
Peas, dried	2 tbsp.	1	27	.....
Potatoes, white	1 medium size	4.25	11	.....
Potatoes, sweet	1 small	2.5	5.5	.....
Pumpkin, cooked	1 c.	13	15.5	.....
Radishes	1 doz.	12	17.9	.....
Spinach	3 servings	14.75	35	.....
Succotash	1 serving	3.5	14.5	.....
Tomatoes, canned	1¾ c.	15.6	21	.....
Tomatoes, fresh	1 large	15.5	15.8	.....
Turnips	2 after cooking	9	13	.....

Finished dietaries should always be tested for the balanced ration. The test to apply being

1. Does it contain the fuel value?
2. Is there a good distribution of protein, fat and carbohydrates?
3. Is the distribution of concentrated with dilute foods good?
4. Is the approximate cost moderate or low?
5. Is there a good supply of ash materials?
6. Is there a balance of acid and base forming material?

TYPICAL BALANCED MENU

For a laboring man for one day

Food	Amount	Calories	Cost
Breakfast			
Oatmeal	1 c.	250	
Sugar	2 tbsp.	50	
Milk	⅝ c.	100	
Banana	1	100	
Bacon	4 slices	150	
Milk	1 glass	150	
Graham gem	2	200	
Oleo	1 tbsp.	100	
		1,100	
Dinner			
Beef stew			
Beef	¼	200	
Carrot	1	100	
Onion	1	100	
Potato	1½	150	
Flour	2 tbsp.	100	
Fat	2 tbsp.	200	
Bread	3 slices	150	
Apple pie	1 piece	200	
Coffee	1 c.	.....	
Milk	2 tbsp.	25	
		1,225	
Supper			
Baked beans	1 c.	250	
Rye bread	2 large slices	200	
Oleo	1 tbsp.	100	
Prunes	¾ c.	200	
Doughnut	1	200	
		950	
		1,100	
		1,225	
		950	
Total for day		3,275	

Standard dietaries can be worked out from any table of food materials (as given in Farmers' Bulletin 142, of the U. S. Department of Agriculture) showing the percentage of nutrients and Calorie equivalents, by keeping in mind the relation of protein to carbohydrates plus the fat reduced to carbohydrate values.

Substitution of one food for another will be necessary to keep the nutritive ratio correct, and with a little practice and experience in working out a few dietaries, one obtains a better knowledge of food compositions than in any other way. Dietaries are made for an entire day or week, since it is not practical or necessary to have each meal balance. In some cases several days may not average up, but at least every week should meet the standard requirement.

QUESTIONS AND PROBLEMS

1. What is meant by a dietary?
2. Of what use are the 100-Calorie portions given in the text?
3. What factors influence the food requirement?
4. What per cent of the total Calories is furnished by the proteins?
5. Why are carbohydrates and fats used for fuel foods in place of proteins?
6. What is a Calorie?
7. Why are the ash foods of importance in planning a dietary?
8. Is it necessary to have a definite proportion of ash foods in the dietary?
9. What are three commonly used foods rich in iron? in calcium? in phosphorus?
10. Why do some foods cost more per 100 Calories than others?
11. Are they worth the additional price to us in food value?

APPLICATION

Work out dietaries for school girl, at 15¢, 25¢ and 35¢ a day.

Girls work out and demonstrate with materials 100-Calorie portions of different foods.

Plan dietary for family of five at $1.50 per day, where the wage earner gets $4.50 to $6.00 per day.

HOME PROJECTS

1. Work out your energy requirement.
2. Work out the energy requirement for each member of your family.
3. Take the menu for one week and compute the number of Calories and test the dietaries to see wherein they were meeting the requirements of the family and wherein they were not.

LESSON 51

FOODS FOR INFANTS

Artificial Feedings—Diets after Weaning

The first year of an infant's life is the most hazardous one for feeding and the one of greatest growth and development. It is the duty of every mother to nurse her baby for the first few months, if possible, since mother's milk answers all the requirements of the child better than any other food. Statistics from many countries show that there is a higher rate of infant mortality among bottle-fed babies than of breast-fed babies and that the normal development is greatest and best among breast-fed children. Most mothers would be able to nurse their babies for the first months at least if they had plenty of good wholesome nouishing food, good care, proper rest and sleep, and a happy mental environment.

When the supply of milk is scanty or if the quantity is sufficient, but the quality to maintain the proper growth and energy requirements is lacking, the baby is restless, cries after feedings and does not sleep soundly. Babies whose food is adequate are happy babies, sleeping from sixteen to eighteen hours a day and go to sleep while feeding.

A baby's crying is caused by some disturbance which may be remedied in most cases. The cry of pain is easily distinguished from that of hunger. It may be caused by too large a feeding or wrong feeding as well as by some external distress. The hungry cry is oftentimes misunderstood to be one of anger or spunk. The mother may have an abundance of milk and not realize that the quality may be making all the trouble.

If the mother's milk is deficient in quantity, it must be supplemented with other feedings. It is poor economy for the mother to go blindly about this important matter. The advice of a physician or specialist in infant feeding is essential

to the well-being of the child. Advertisements portraying healthy babies in all stages may advertise good baby food, but that food might not be suited to all babies any more than all foods are suited to all grown persons. Health clinics and baby welfare organizations are established in most communities and offer free service to mothers who are not able to obtain the services of a physician for this purpose.

Feedings.—In infant feeding regular schedules must be maintained to obtain the best results. In some cases a three-hour schedule and in others a four-hour is best. When the quantity of milk is sufficient and the baby is properly maintained on a four-hour basis, this schedule is best. No amount of training, if the baby is under-nourished on a four-hour schedule, will make a happy baby and a three-hour schedule then is best. The night feedings are a matter of habit with the well nourished baby. It may easily be trained to go eight hours, omitting the two o'clock morning feeding and, before the child is many weeks old, it may be trained to omit both night feedings, the ones at 10 p. m. and at 2 a. m., going from 6 p. m. to 6 a. m.

Weight a Guide in Feeding.—The best way of determining the growth and whether the feedings are adequate, is by weighing the baby. Normal breast-fed babies should gain six to eight ounces each week for the first five months and four to six ounces each week during the remainder of the year. A general rule for weight is that babies should double their weight at birth in the first six months and treble it by the end of the first year. It is folly to weigh a normal baby every day or after each meal. Once a week is enough. A chart should be kept of the weights. It is not alarming if the weight increase one week is below that of the previous week; but, if the weight in two weeks shows a lack of proper gain, then it is wise to consult a physician.

Artificial Feedings.—When mother's milk needs to be supplemented with some other milk or food or when the

mother is not able to nurse the baby at all, the feedings are spoken of as artificial feedings. Artificial feedings are greatly varied according to what will best serve the particular child. Cow's milk is the nearest approach to mother's milk of any food but contains very nearly twice as much protein and not as much sugar as mother's milk. The fat content is about the same, but is not so finely emulsified as in mother's milk.

Cow's milk, when used, should be the very best obtainable. It should be clean, fresh, pure, and of uniform composition and either certified or pasteurized. Milk purchased by bulk from open cans or from uncertain sources should never be used for infant feeding. The milk used must be made as near like mother's milk as possible so that it will be perfectly digested without any difficulty and also supply the proteins, milk sugars, minerals, and vitamines in the proper quantity. It should also be certified or pasteurized. A physician should be consulted as to the best means of modifying the milk for artificial feedings.

Modifying usually means the addition of some sugar to meet the energy requirement and the addition of sterile water or cereal water to increase the fluid volume to meet the infant's daily needs.

The *sugar* used in modified milk may be (1) Lactose, or milk sugar, (2) Malt sugar, combined with dextrin in a prepared form called dextri-maltose, (3) Cane, or granulated, sugar, or (4) Blue label Karo corn sirup.

Milk sugar and dextri-maltose are both soluble in water and easily digested and are better suited for infant feeding than plain sugar. The proportion of these sugars as well as their use should always be left to the physician.

Milk sugar is used for the first two or three weeks for the new baby and thereafter some mixture of maltose and dextrin which is not so sweet as cane sugar is used.

One tablespoonful of 50% Karo solution (2 tbsp. water, 1 tbsp. Karo) is equal to 1 tablespoonful of dextri-maltose

for sweetening a milk mixture, and may be used if it is not practical or convenient to buy the dextri-maltose mixture.

Boiled water may be used in modified milk in some cases. This is boiled twenty minutes before adding to the milk.

Cereal water is used to modify milk in many cases. The cereals used are oatmeal and barley. Rice is also used in special cases.

Buttermilk is used successfully in many cases where cow's milk causes distress and can not be retained by the baby. It is used with or without modification.

To Prepare Milk Bottles.—There are two types of nursing bottles, one with a small neck which requires a large nipple. The other is a straight bottle without a neck and requires a large top, but has a small nipple. Either type may be used, if proper precaution is taken in cleaning and sterilizing the bottle. The straight bottle is recommended, since it is easier to clean; but in many cases the baby, when first changed to the bottle, refuses to nurse from a small nipple and will nurse readily from the bottle with the large nipple. Every milk bottle should be emptied and rinsed out with clear cold water after it has been used. Let the bottle stand filled with water to which has been added a pinch of soda or borax powder until the next morning when all the bottles are prepared at one time for the next 24 hours' feeding. Nipples should be rinsed with clear water and let stand in a covered glass jar filled with borax solution. One eight-ounce bottle should be provided for each feeding and the same number of nipples, using a different bottle and nipple for each feeding. New corks to fit the small-necked bottles are better to use than cotton, since the cotton sticks to the neck of the bottle and may interfere with the feeding. Caps for sealing the straight bottles should be purchased, Sterilize all bottles every morning. Fill with the prepared food, seal, and set in the ice box until feeding time.

To sterilize bottles, empty out the water, wash well with

hot soapy water, using a bottle brush, rinse thoroughly and sterilize bottles in a pan of boiling water for 20 minutes. Wash the nipples in clear water with a small brush. Boil 4 to 5 minutes once a week and then put in a solution of boric acid. Nipples need not be boiled every day, if properly washed. Boiling makes them too soft, so that they collapse when used.

A boric solution is made by adding 1 teaspoonful of boric acid to 1 pint of hot water.

Filling bottles by either open-kettle or cold-pack method.

Open kettle. Use a small funnel for filling the bottles. Sterilize the funnel and pour the hot prepared milk solution into the hot sterile bottles. Dip the corks into boiling water and seal each bottle as soon as filled. Babies only a few weeks old require 3 to 4 ounces at a feeding and later 6 to 8 ounces, depending mainly upon the number of feedings during the day. The total number of ounces of food for the day is divided by the number of feedings. For example 30 ounces a day with 4 feedings requires 7½ ounces in 4 bottles or for 6 feedings require 5 ounces to each bottle. The physician will state the number of ounces of food to be used each day.

Cold packing the milk solution for baby feedings is practically the same as for cold-pack products. The clean bottles are filled with the milk solution, corked lightly, and set upright in a rack which fits into a covered kettle with water to cover. The whole is boiled or processed 12 to 15 minutes. Then the bottles are removed and tightly sealed. Filled bottles of milk solution must be kept in a cold clean place until feeding time.

Temperature of Feedings.—Heat the bottle in a pan containing hot water gradually to 98° to 100° F. This temperature is best determined by dropping a drop from the bottle on the inside of the wrist. It should be warm, but not hot. Adjust a clean nipple and see that the milk flows through the openings freely without too great a flow. Feed the baby

while the solution is of the right temperature. Never expose the solution to the air after it is prepared. Always warm the solution in the bottle while corked lightly.

Drinking water should be given to babies only between feedings. From 1 to 2 ounces of boiled water cooled to the temperature of 98° F. will usually quiet a fretful baby. If the quantity of milk taken by the baby is sufficient, however, the baby needs very little water.

Orange juice is given to bottle-fed babies between feedings to furnish vitamine C which is lacking in a diet of pasteurized milk. It is also an aid in regulating the bowel movements. Orange juice is given to babies at the age of 3 months and continued until other foods which serve the same purpose are included in the diet. One tablespoonful of orange juice daily is about the proportion for a 3-months baby, increasing to 3 or 4 tablespoonfuls daily for the 6-months-old baby.

Cod-liver oil is now often prescribed in the winter or spring for babies as a source of vitamine A and for strengthening the bones and preventing rickets.

Additional Feedings.—At the age of 5 months the milk feedings should be supplemented by other foods in a small quantity at first and gradually increased as the capacity for digesting food grows. Be careful not to overfeed the infant or to give it a new food without consulting a physician. Overfeeding causes digestive disturbances.

At 6 months a well cooked cereal, such as one of the prepared wheat foods, should be added. The quantity of all foods must be determined by the physician.

At 7 months spinach is added, using at first 1 teaspoonful of well cooked spinach salted slightly and put through a strainer, and a bit of butter added.

At 8 months cooked spinach and carrots put through a strainer or ricer may be used at the 2 p. m. feedings. One to 2 tablespoonfuls or more may be used.

At 9 months baked potato, baked apples together with the cereal, vegetables, and milk comprise the diet.

At 10 months cream vegetable soups, crisp bacon, a cereal, vegetable, and some fruit every day.

The vegetables best suited to this stage of infant feedings are spinach, carrots, asparagus, cauliflower, peas, onions, and string or wax beans. These must all be well cooked in a small quantity of water seasoned sparingly with salt and put through a vegetable ricer or strainer.

The fruits best suited are apples, apricots, prunes, peaches and pineapple, well cooked and put through a strainer.

The cereals best suited are wheat, oatmeal, rice, and barley. These require at least 2 hours cooking in a double boiler.

A small proportion of babies does not tolerate cereals and vegetables until the latter part of the first year. Such cases should be left to the direction of a physician.

Cottage cheese, junket, gelatin jellies, dry toast and arrowroot cookies may also be used. Graham crackers should be used sparingly with young children, unless the child requires a laxative food.

Weaning the infant from the bottle or from the breast is done about the end of the first year, but depends upon the state of health of the infant and the time of the year. By giving fewer nursings and more bottle feedings the weaning should be accomplished gradually by the end of a month or two. No decided change in an infant's feedings should be made during the hot summer months, when there is danger of intestinal trouble.

Foods after weaning (1-2 years) include the same type as before, continuing the green leafy vegetable and cereal serving each day, also some well cooked fruit with the addition of some other foods such as scraped lean beef (broiled in a little cake long enough to only sear the outside) seasoned with salt, finely chopped breast of chicken, and soft-boiled, poached or coddled eggs (the yolks especially). At least 1½ pints

of milk should be used in the diet every day either as a beverage or part in a cream soup or in custards.

All foods should be well cooked and then put through a vegetable ricer or strainer to remove all the coarse fiber. No fried foods or foods difficult of digestion should be allowed. The breads should be in the form of toast or zweiback. No fresh or quick breads should be used.

Additional feedings as prescribed by different physicians vary greatly and what one advocates for one case is frequently just the opposite from what another physician prescribes for an apparently similiar case. The mother is, therefore, very much in doubt and she is apt to make the mistake of mixing up her plan of feedings with that of some friend which naturally upsets both. The only safe course is to have a physician versed in infant feedings specify the special foods for the case and then follow that one plan regardless of what anyone else advises.

The above outline of feedings is one now prescribed at a children's clinic in one of our largest cities. It has been worked out by eminent physicians regarded as authorities in pediatrics and has proven most successful.

The Use of Meat in the diet of very young children is a subject of considerable discussion. When milk forms a large part of the food, it furnishes all the necessary protein for building purposes and is the best source of calcium and iron. But when for some reason milk can not be included in the diet or the child refuses to take milk, as sometimes happens, then some other food which supplies protein and iron must be added to take its place. Vegetables and egg yolk rich in iron are then used in greater proportion. Many physicians now prescribe the scraped beef cake for the diet. Beef in this form contains no indigestible fiber and is given in small quantities of 1 to 2 tablespoonfuls twice a week.

It is said by some specialists in infant feeding that, when milk and eggs are used freely in the diet, there is no need for

the addition of meat until after the third year and that there are several reasons why meat should not be given before that time. One reason is that meat protein is more liable to putrefaction in the intestine than milk or egg protein and the younger the child the more rapidly are the products of putrefaction developed. This condition interferes with the utilization of the iron content. When milk and egg protein are given without meat these disturbances are not present. Another reason given for withholding meat from the diet is that meat contains extractives and is poorer in ash content than milk. The extractives are apt to create an appetite for foods of more pronounced flavor and cause the child to refuse to eat the grain foods and foods of bland flavor.

The Energy Requirements.—The building of the body of the infant requires a great deal of material and consequently the energy requirement is high. Food authorities estimate that the average energy requirement of an infant is as follows:—

About 40 Calories daily a pound up to the age of 3 months.

About 45 Calories daily a pound from 4-6 months.

About 40 Calories daily a pound from 7-9 months.

About 35 Calories daily a pound up to the age of one year.

Infant Mortality.—Statistics show that a very undue proportion of deaths occur in children under one year. Campaigns laying stress on pure water, fresh air, sunshine, sanitary conditions, and proper feeding have reduced infant mortality almost by half. In New York City during 1890, 1891, and 1892 the deaths under one year were 26% of all deaths. During the years 1917, 1918, and 1919 the percentage had been reduced to 14.4%. The percentage for children from one to two and from two to five was reduced in like proportion.

QUESTIONS AND PROBLEMS

1. How can you tell whether the food of a baby is sufficient?
2. How much should a baby gain in weight in 6 months? 1 year?

3. Where can you learn about the proper feeding for infants?
4. Why is it essential for mothers to know all about this subject?
5. Why should girls in Domestic Science classes know anything about infant feeding?
6. How would you sterilize the babies' bottles?
7. How should nipples be cleaned and kept?
8. What is the correct temperature of the milk for feeding a baby?
9. How can you determine this?
10. Why are vegetables added to the diet of such little babies?
11. Could tomato juice be used in place of the orange juice for babies?
12. Why should all milk which is left after the feedings be discarded and not reheated for another feeding?
13. What are the symptoms of overfeeding of a baby?
14. What are the symptoms of underfeeding?
15. What are the approximate number of Calories required for a normal baby of 6 months? One year?

APPLICATION

Sterilize milk bottles.

Modify cow's milk using oatmeal water and dextri-maltose according to the following formula:—

14 oz. milk
10 oz. oatmeal water
5 tbsp. dextri-maltose or 1⅔ tbsp. sugar.

Change the formula to be correct for four feedings of 8 oz. each. Rewrite the formula in terms which may be measured with the measuring cup.

(This formula is for class work and should not be used for infant feeding unless it is found to answer the specific needs of the case.)

1. Oatmeal Water

1 qt. boiling water 3 tbsp. oatmeal
Pinch of salt

Method.—Boil together until it is reduced one half or down to 1 pt. Put through a strainer. Enough cereal water may be made at one time to last for two days if it is kept cold and well sealed.

2. Barley Water

1 qt. boiling water 3 tbsp. pearl barley
Pinch of salt

Method.—Same as for oatmeal water.

3. Rice Water

1 qt. boiling water 3 tbsp. rice

Pinch of salt

Boil down to one quart and make the same as oatmeal water.

4. Pasteurized Milk

Method.—Put milk in sterilized, small-mouth glass bottles, stop with clean corks or absorbent cotton, place bottles in a wire basket, and immerse the basket in a kettle of cold water. Heat water gradually to a temperature of from 160° to 170° F. Keep at this temperature 30 minutes; remove and cool bottles quickly and keep in cold water.

HOME PROJECTS

1. If there is a baby in your home having artificial feeding, sterilize the bottles and help to prepare the formula for its feedings.
2. Examine the formula used for modifying the milk used and see how it varies from the one given in this lesson.
3. Take care of the bottles after the feedings. What should you do with them?

LESSON 52

FOODS FOR YOUNG CHILDREN

During the early years of the child's life, when it is gradually taking on new foods, milk remains the principal food and should not be replaced by any other food. Milk furnishes the calcium and the phosphorus essential to the bone-building processes and, while its iron content is not so large, all the constituents in milk are in easily-digested form, which fact makes it of first importance in the diet of growing children for 4 or 5 years. About 1½ pints of milk a day is necessary for children up to 5 years of age. It need not be used entirely as a beverage, but it should be used as a basis for the diet. It may be given in the form of a vegetable soup, simple dessert, cocoa, or be served with the cereal.

Variety of diet is thus secured and is necessary with all ages. Poached, coddled or soft-cooked eggs, well cooked cereals and some fruit should be used every day in the diet of the young child. One green leafy vegetable of mild flavor is absolutely essential in one meal every day. This should be well cooked and the water in which it was cooked utilized in some way in the day's dietary. Starchy foods furnishing the fuel for energy needs may be supplied by baked or mashed potatoes, well cooked rice, good breads, using the dried toasts and breads which require mastication. Hot breads of all kinds should be avoided as well as all candies, fried foods, pastries, and rich cakes. Simple cookies, desserts, and crackers may be used.

The normal healthy child is the child whose diet consists of the right kind of wholesome nourishing foods and one who has not been spoiled by the use of foods served to the older members of the family.

Food Requirement.—The muscular activity is so variable during these years and boys vary so from girls that it is not

possible to give a standard food requirement which meets the needs of all cases. During their active growing years a standard requirement resulting from an average of many children may be used and then adapted to the case in hand according to the weight and the appetite demand. Milk, cereals, and bread may always be added to the diet, if the child is still hungry and requires more food. If the child does not eat these, then it is an indication that the food supply is adequate. In no event should food be allowed between meals. Constant lunching destroys the appetite for the regular meal. Although it may require much patience in training and apparent heartlessness on the part of the parents to deny the child food between meals, it is absolutely necessary to their good food habits and health that food be eaten only at regular meals.

In childhood both the energy and the protein requirement are high—as much as two times as high for each unit of weight as for adults without a corresponding increase in the muscular activity. Sunshine, fresh air, physical exercise, and rest are extra factors in the problem. While they increase the food requirement, they enable children to better utilize the food they eat.

The Approximate Energy Requirement of a Child During Growth

Age	Calories per pound per day	Total Calories per day
First year	45	900
1-2 years	45-40	1200- 900
3-5 years	40-36	1500-1200
6-9 years	36-30	2000-1400
10-13 years	30-27	2200-1800
14-17 years	27-20	3000-2200

The greatest number of Calories is provided by the meal in the middle of the day. There should be three meals, the one in the morning containing more Calories than the one at night. Midway between the morning and noon meals

a cup of milk may be taken, if the child drinks milk and seems to require something besides water. Numerous diet plans for the average child are available and may be adapted to use without much modification.

The *undernourished child* requires a special diet and should be taken to a physician or special clinic where expert advice may be had as to the proper and necessary foods to include in its dietary. Malnutrition is the indirect cause of most ills in young growing children. It is first indicated by pronounced underweight and may be accompanied by pale, sallow skin, much nervousness, dark circles under the eyes, lack of sound sleep and no desire for muscular activity.

A well nourished child.

Statistics compiled by a survey of medical clinics in a tenement district in one of the largest cities show that malnutrition is not caused so much by insufficient food as by the constant use of wrong foods or the inability of the body to make use of the food eaten, on account of insufficient air, rest, sunshine or some physical defect.

Of the 2,181 apparently well children examined approximately 30 per cent were found to be undernourished. Of the 275 families represented 227 required instruction in the preparation of proper foods, 198 needed assistance in the planning of meals, 88 required special diets, while only 27 lacked sufficient money to provide adequate food.

Because the effects of malnutrition are slow parents fail to detect the condition until too late. Much of the sickness and lowered vitality in later life is the result of poor nutrition in childhood.

The weights of children should be taken regularly and checked with the standard weight table, according to height, age and sex. A weight of 7% to 10% below normal for the height and age is a pretty sure indication of malnutrition.

Children of school age in most schools are examined and weighed regularly and all cases checked by the school nurse. Children below school age should also be weighed at frequent intervals and tables of weight and height of normal children consulted.

The comparison of weights of children has been found to

Left—Showing an undernourished child. Right. Showing the same child after a course of proper diet.—*Courtesy Home Economics Department, College of Agriculture, University of Minnesota.*

arouse keen interest among the children and a sort of competition from week to week makes an interesting game. Perhaps the greatest good derived from taking the weights regularly is in getting children to know and eat the right foods and live according to health rules in the hope of excelling in physical and mental strength. A card catalog should be kept to show the record of every child.

If sunshine, fresh air, good sleep, and exercise with wholesome foods fail to bring the state of health up to normal

and symptoms are still present, it is time to consult expert advice as to the cause and proper food requirement.

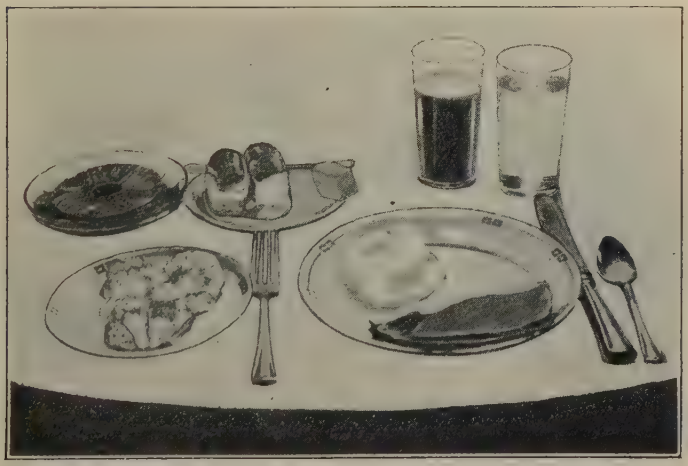
By the time the child goes to school the right food habits should be well established. The great mistake is made here by most mothers in thinking that the food of the school child needs no further attention and that the same foods may be used for the child as for the adult. All during the school years the child's body requires much growing material in the best form and the diet of the school child should be planned for separately and simple wholesome foods in the right quantity to serve the growing energy needs should be given.

Menu for one day for girl 10 to 12 years old should be 2,050 Calories.
Breakfast—715 Calories, as follows:—
Orange, 1 whole, 100 C. Cream of wheat ½ c., 100 C. Cream, ⅛ c., 100 C. Sugar, 2 tbsp., 35 C. Whole wheat toast, 1 slice, 50 C. Butter, 1 tsp., 30 C. Cocoa, ¾ c., 300 C.

The noticeable increase of appetite during this period of growth is evidence of the great needs of the body for its energy and constructive processes. Many a mother complains about the enormous appetite of her child of school age and the constant demand made upon the cookie jar. If meals are adequate and contain right foodstuffs, the desire to lunch between meals will be overcome.

The hearty appetite is a sign of health and should be satisfied. The lunching of sweets and nibbling of candy will not stop the craving for something to eat. This can only be satisfied by good substantial foods of cereals, bread, vegetables, meat, fruits, and plenty of milk.

Breakfast for the children of school age should consist of cereals, well-baked breads, eggs, bacon, and either milk or cocoa for the beverage. Pancakes and waffles should be given only on rare occasions.



Dinner—745 Calories, as follows:—
Roast beef, 1 serving, 100 C. Mashed potatoes, 1 serving, 175 C. Brown gravy, ⅓ c., 20 C. Cauliflower, 1 serving, 50 C. Parker House roll, 1 large, 60 C. Butter, 1 tsp., 100 C. Pineapple, 2 slices, 100 C. Whole milk, 1 glass, 140 C.

Dinner is best served at noon for children under ten so that it will not interfere with early sleep, which is necessary for good development. The meal at noon should consist of the following type of foods:

A soup, one of the cream vegetable soups, a mild meat broth containing vegetables or cereals, or bean purée.

Eggs, poached on toast, omelet, or scrambled, never fried.

Hot dish of baked rice, macaroni and cheese, spaghetti and tomatoes.

Vegetables such as spinach, carrots, peas, asparagus, cauliflower, Brussels sprouts. These should be included in the diet at least once every day and be properly prepared. The taste for vegetables can easily be acquired if they are prepared in the right manner and served attractively.

Breads should be chiefly yeast breads well baked and made of wheat flour or any of the coarse flours for variety.

Luncheon or Supper—590 Calories as follows:—Macaroni, 3 sticks, 80 C. White sauce, 1 c. 100 C. Bread, 2 slices, 100 C. Butter, 2 tsp., 60 C. Prunes, 4 large, 100 C. Sugar cookies, 2 small, 40 C. Whole milk, 1 glass, 100 C.

Toast, zweiback, plain, crackers and Graham crackers are also recommended.

For variety in the breadstuffs different shapes of rolls may be used and additional flavors such as jelly, jam, sugar, nuts, dates, raisins, and sometimes cinnamon may be used.

Butter should be used freely, as it is very valuable in the diet. If whole milk is used freely, cheaper forms of fat may be substituted in place of butter to some extent.

Desserts should be simple, such as stewed fruit, junket, custards, blanc mange, rice or good pure ice cream made from whole milk with fruit juices. Heavy steamed pud-

dings, rich pastries, and fried foods such as doughnuts and fritters should be eaten very sparingly during school age and never under any circumstances at night.

Milk should remain the basic source of calcium during the entire growth period and the diet of high school as well as that of young school children each day should include milk in some form. If milk soup is served or other foods containing milk, then milk as a beverage may be omitted for that meal.

Meats, when used, should be well prepared, broiled, roasted or stewed, never fried. Beef, mutton, lamb, chicken

The above rats were of the same age. The one on the left was given a diet low in calcium. The one on the right was given an adequate diet. The skeleton of the one on the left was undeveloped.—*Courtesy Nutrition Laboratory, Battle Creek Sanitarium.*

liver or crisp bacon are the best meats. Pork and meats rich in fat require longer time for digestion.

Condiments which are stimulating and beverages such as tea and coffee should not be used. Natural-flavored foods and foods of moderate temperature are best for children.

For the older children who have dinner at night the noon meal may contain about an equal quantity of food with the night meal and the plan as here outlined may serve very well, but a greater choice of hot dishes may be allowed.

The evening meal for children up to ten years of age should be simple and served not later than six thirty. The

WEIGHT—HEIGHT—AGE TABLE FOR BOYS

Height Inches	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.	19 Yrs.
38	34	34													
39	35	35													
40	36	36													
41	38	38	38												
42	39	39	39	39											
43	41	41	41	41											
44	44	44	44	44											
45	46	46	46	46	46										
46	47	48	48	48	48										
47	49	50	50	50	50	50									
48		52	53	53	53	53									
49		55	55	55	55	55	55								
50		57	58	58	58	58	58	58							
51			61	61	61	61	61	61							
52			63	64	64	64	64	64	64						
53			66	67	67	67	67	68	68						
54				70	70	70	70	71	71	72					
55				72	72	73	73	74	74	74					
56				75	76	77	77	77	78	78	80				
57					79	80	81	81	82	83	83				
58					83	84	84	85	85	86	87				
59						87	88	89	89	90	90	90			
60						91	92	92	93	94	95	96			
61							95	96	97	99	100	103	106		
62							100	101	102	103	104	107	111	116	
63							105	106	107	108	110	113	118	123	127
64								109	111	113	115	117	121	126	130
65								114	117	118	120	122	127	131	134
66									119	122	125	128	132	136	139
67									124	128	130	134	136	139	142
68										134	134	137	141	143	147
69										137	139	143	146	149	152
70										143	144	145	148	151	155
71										148	150	151	152	154	159
72											153	155	156	158	163
73											157	160	162	164	167
74											160	164	168	170	171

PREPARED BY BIRD T. BALDWIN, PH. D., AND THOMAS D. WOOD, M. D.

These tables represent a large group of presumably healthy children, most of whom are native born.

Remove the child's outdoor clothing, shoes and coat. Take heights in erect position, with heels and shoulders against the wall, upon which should be an accurate measure.—*Courtesy The American Child Health Association.*

WEIGHT—HEIGHT—AGE TABLE FOR GIRLS

Height Inches	5 Yrs.	6 Yrs.	7 Yrs.	8 Yrs.	9 Yrs.	10 Yrs.	11 Yrs.	12 Yrs.	13 Yrs.	14 Yrs.	15 Yrs.	16 Yrs.	17 Yrs.	18 Yrs.
38	33	33												
39	34	34												
40	36	36	36											
41	37	37	37											
42	39	39	39											
43	41	41	41	41										
44	42	42	42	42										
45	45	45	45	45	45									
46	47	47	47	48	48									
47	49	50	50	50	50	50								
48		52	52	52	52	53	53							
49		54	54	55	55	56	56							
50		56	56	57	58	59	61	62						
51			59	60	61	61	63	65						
52			63	64	64	64	65	67						
53			66	67	67	68	68	69	71					
54				69	70	70	71	71	73					
55				72	74	74	74	75	77	78				
56					76	78	78	79	81	83				
57					80	82	82	82	84	88	92			
58						84	86	86	88	93	96	101		
59						87	90	90	92	96	100	103	104	
60						91	95	95	97	101	105	108	109	111
61							99	100	101	105	108	112	113	116
62							104	105	106	109	113	115	117	118
63								110	110	112	116	117	119	120
64								114	115	117	119	120	122	123
65								118	120	121	122	123	125	126
66									124	124	125	128	129	130
67									128	130	131	133	133	135
68									131	133	135	136	138	138
69										135	137	138	140	142
70										136	138	140	142	144
71										138	140	142	144	145

PREPARED BY BIRD T. BALDWIN, PH. D., AND THOMAS D. WOOD, M. D.

See note under corresponding table for boys.—*Courtesy The American Child Health Association.*

foods best suited are milk toast, cream soups, eggs, simple puddings and cooked fruit with bread and butter and plain cookies.

For the older children the dinner at night should include a portion of meat well prepared, also a salad of fresh green vegetable or fruit combined with French dressing. Heavy meat salads with mayonnaise dressing are not suitable for children and should be eaten sparingly even by adults.

Regularity of the three meals is always essential. Breakfast should be early enough to allow ample time for deliberate and thorough mastication of the food. Going to school without breakfast or with food hastily swallowed is a very bad habit from a health standpoint. Several hours should elapse between meals so that the stomach may digest the food from one meal and rest before the food from the next meal is received.

A few simple foods at one meal are always better than a great many foods and too large a portion of food at a time causes much distress and makes good digestion impossible. It is always unwise to eat just before retiring at night and to use much liquid with the meals.

The basis of all diets for school children should be good milk, fruit, green vegetables, and whole cereals. Proper food and play are said to be the secrets of normal development.

QUESTIONS AND PROBLEMS

1. Why is the proper food for growing children important?
2. What type of foods should be included in each day's dietary for school children?
3. Why is milk of value in the diet?
4. Of what use are vegetables?
5. Why is proper mastication necessary?
6. Why is lunching between meals a bad habit?
7. How can you tell whether the food needs are being supplied?
8. What is meant by malnutrition?
9. How many Calories should children in the grades have?
10. How many Calories should teachers have?

APPLICATION

1. Work out dietaries for yourself and the other children in your family.
2. Plan a dietary for an anaemic girl of 12 years of age.
3. Plan a dietary for a boy of 12 years of age with active muscular exercise.
4. Plan a dietary for a child of seven years of age of active life.

HOME PROJECTS

1. Prepare a cream soup and a custard dessert for children's meals during the week.
2. Make a record of the meal plans for this week at home and compute the number of Calories in each meal and the number of Calories derived from the proteins.

LESSON 53

SCHOOL LUNCH—SANDWICHES

Where children take their lunch to school it is an added problem to prepare suitable foods that will carry well and be appetizing at noontime. Too many school lunches consist of hard-boiled eggs, a piece of cold meat, a pickle and a piece of pie or cake. It is just as easy to plan a wholesome lunch for the lunch box as a wholesome lunch on the table. Suitable dishes for carrying foods may be purchased. Custard cups for puddings, custards and gelatin jellies; a thermos bottle or a good heavy bottle for hot cocoa or cold milk; paraffin paper for wrapping sandwiches and foods separately and pretty enameled plates and cups with either paper or small colorful napkins all add to the attractiveness of serving and makes a plain lunch taste better.

Containers for Lunch.—Lunches should be packed neatly in a good substantial box or basket well fastened and preferably one with a handle to insure its being carried in the right position. If the same container is used each day, it should be emptied promptly after school and left open in the air to remove any food odors. Fresh napkins should be used each day.

Packing the Lunch Box.—Foods must be wrapped separately. Soft foods such as cooked fruit, jellies, puddings, etc., carry best in covered jelly glasses or custard cups. The dishes and food should be arranged in order of use, if possible, the napkins on the top and the foods below. Place all dishes below the sandwiches and avoid making the basket one-sided and difficult to carry. Use plenty of paraffin paper to separate the foods and keep each in a good condition. Be sure to add the necessary spoon, a cup for liquids, a little salt shaker, if salt is necessary, and an occasional surprise in the way of a few nut meats, dates, or a piece of maple sugar, to give the little lunch an added interest.

Foods for the school lunch box include sandwiches, fresh and cooked fruits, simple desserts, milk, cocoa, plain cookies, gingerbread or little cup cakes. For an occasional relish celery or radishes may be added. If the dessert or fruit is omitted, a few dates, raisins, figs, nut meats, one or two pieces of good candy may be used in its place. When fresh fruits are used, they satisfy the appetite for flavor foods and the use of pickles or olives in the school child's lunch is not necessary and should be avoided.

Only a few foods well prepared and wrapped should be used at one time, with something different for the lunch next day. The repetition of the same foods and monotony of flavors spoils many a good lunch.

Hot Food for Lunch.—Hot cocoa makes a very good addition to the lunch in cold weather and may easily be carried in a thermos bottle or heavy glass bottle wrapped in many folds of stiff plain paper. Never use newspapers in the lunch box. In some schools a hot dish is prepared by the older girls of the school and children may purchase a serving at a very little cost. This lunch is of great value in the diet of the school child and is good experience for the girls who plan and prepare the food to be served.

The hot dishes prepared at school should consist of nourishing, easily digested foods. These may include cream soups (where equipment permits) of corn, pea, celery, bean, and tomato; au gratin or scalloped dishes of macaroni, spaghetti or rice with white sauce and some flavor food; a hot beverage of cocoa or chocolate; hot sandwiches of baked hash (beef, pork, and potatoes) on rye or white bread, baked beans on brown bread, hot weiners on rye bread.

The means of serving hot food may be very simple and be provided for by a food sale or by contributions.

SANDWICHES

Sandwiches form the basis of most lunches, whether it is the simple lunch put up for the school boy and girl, for the

working man, or the more elaborate one for the picnic basket.

Materials for Sandwiches.—*Bread* to cut well must be at least a day old, when it makes the best sandwiches. Delicious sandwiches, however, may be made with new bread. The kinds of bread used are white, brown, rye, whole wheat, corn or nut, or a combination of two or more.

The *butter*, to spread more easily and evenly, must be creamed, as in cake-making.

The *fillings* used determine the kind of sandwich, and a great variety is made from cooked (warm or cold) meat, fish, fresh greens, eggs, nuts, cheese, fruits, pickles, and jellies. Mayonnaise and cooked salad dressings are used to combine many of the materials used for fillings.

Shapes.—Sandwiches are made in a variety of shapes and cut very thin. Those for picnics or a child's lunch are best made of bread about $\frac{1}{4}$ inch thick and cut in squares, triangles, oblongs, or circles, with substantial fillings.

For afternoon teas, slices of bread are cut not over $\frac{1}{8}$ inch thick with a sharp knife, and the slices are then cut into different shapes with fancy cutters. The sweet fillings, like jellies and marmalades, are best to serve at small teas.

Methods of Making.—Cut the bread for sandwiches with a sharp knife and make all slices of uniform thinness. Remove the crust of the bread and spread each slice with the creamed butter before cutting. If the sandwiches are to be cut with fancy cutters, it is best to shape before spreading, in order not to waste any butter. Spread half of the number of slices with filling to be used, and fit the remaining slices on top.

To keep sandwiches moist when they are prepared several hours before they are served, wrap them in a damp napkin until ready to use, or wrap them in paraffin paper. Keep in a cool place.

For the lunch basket always wrap each sandwich separate to insure its carrying well and be neater for serving.

Serving.—When serving sandwiches in large quantities for a picnic, pile the wrapped sandwiches neatly on a plate or basket.

For afternoon teas do not wrap sandwiches in paper, but serve them piled neatly on a doily on a plate or basket, garnished with parsley, lemon, celery tips or nasturitiun leaves or blossoms. Sandwiches with several kinds of filling may be served on the same plate.

Sandwiches, showing a dainty variety of kinds and shapes and a way of serving.

Thirty Suggestions for Sandwiches.—Many dainty and delicious combinations are possible in sandwiches. The following are suggested:—

Sandwiches with Fillings of Meat, Eggs, Nuts, Cheese

1. Equal parts of finely cut nuts and grated cheese with cooked or mayonnaise salad dressing.
2. Equal parts of grated cheese and olives cut fine mixed with mayonnaise.
3. Equal parts of cream cheese and pimiento.
4. Ham, veal, or sweetbreads sliced thin or minced fine with boiled egg cut fine.

5. Beef or tongue chopped fine with Worcestershire or horse-radish sauce.

6. Sardines (split and boned), lemon juice, and paprika.

7. Peanuts chopped and salted with salad dressing, with white or whole-wheat nut bread.

8. Rye bread, chives, and Swiss cheese.

9. Fresh crisp lettuce with mayonnaise dressing.

10. Cold chicken or lobster, chopped, seasoned, and moistened with lemon juice or salad dressing.

11. White bread, cold chicken, lettuce, slice ripe tomato.

12. Left-over cooked veal, beef, pork or fowl ground fine, salad dressing.

13. Hard-cooked egg yolks, mayonnaise dressing.

Sandwiches with Sweet Fillings

14. Raisins and nuts chopped fine and moistened with grape juice.

15. Nasturtium blossoms and stems and bread and butter packed in a box over night to perfume the bread. Garnish with fresh blossoms.

16. Crushed maple sugar with thick cream with whole-wheat bread, or nut bread.

17. Marmalade and chopped nuts on white bread or sponge drops.

18. Cut fresh bread while warm, spread with a sweet mixture, roll up and tie with ribbon.

19. Preserved canton ginger in thin slices with plain bread and butter.

20. Alternate about 6 layers of white and Graham bread. Use nut or fruit filling and slice across.

21. ⅓ cup. chopped dates, ¾ chopped apple, salad dressing; cut in different shapes.

Hot Sandwiches

22. Chicken liver with brown sauce and toast.

23. Fresh toasted bread, broiled mushrooms, sliced tomato and salad dressing.

24. Clubhouse,—freshly made toast, lettuce, chicken, and hot bacon with mayonnaise.

25. Combination,—freshly-made toast, chicken, tongue, bacon, fresh tomato and lettuce, with mayonnaise dressing.

26. Grated cheese on bread, toasted.

27. Cooked navy beans on white or brown bread.

28. Hot mashed potatoes, slice of roast beef, brown gravy, bread.

29. Hot crisp bacon, cooked egg.

30. Scraped lean beef, seasoned, spread between thin slices of bread and toasted on both sides.

QUESTIONS AND PROBLEMS

1. What effect has an untidy lunch basket upon the appetite?
2. Name five sandwich combinations which would be good for your school lunch.
3. Name five sandwich combinations which would be good for a man's lunch.
4. Name five hot sandwiches which might be used at home for the hot dish at lunch.
5. Why should you be careful not to make sandwiches too moist?
6. Why are newspapers bad in a lunch basket?
7. What is meant by the energy requirement of a child?
8. How may Calories do you require a day?

APPLICATION

Demonstrate cutting bread thin and in fancy shapes.

1. Plan list of foods suitable to use for school lunch baskets for children; for father's lunch; for brother's lunch.
2. Plan picnic lunches, listing foods suitable for carrying.
3. Discuss means of carrying different foods.
4. Prepare sandwiches, each girl work alone and make one kind.

Suggestion.—Class picnic out or indoors, each girl to bring own lunch basket and exchange with someone. Comparison of lunches as to food value, appearance, cost and suitability for school child.

HOME PROJECTS

1. Put up lunch basket for members of the family. See whether any improvement can be made in manner of packing.
2. Plan a picnic supper for the family. Prepare, pack and manage the serving of it.

LESSON 54

FOOD FOR THE SICK

Diets—Invalid Cookery

Food for the sick is an important subject, and much time can be given to this one branch of cookery. The quantity and kind of food for patients must be varied according to the nature of the disease.

The quantity of foods required for each particular patient should be estimated and proportioned to the number of feedings during the day.

A housekeeper with a knowledge of foods and food values suitable to different diets is of great assistance to a physician and is able to carry out his orders satisfactorily and can even perform the services of a trained nurse in simple cases or in emergency.

Eccentric tastes and food habits are often indulged in by many persons in normal health without any very great effect upon the general routine of meal planning, but in times of illness these same tastes become very difficult problems to overcome. Much diplomacy and patience must be used to get sick members of the household to eat the foods which are suited to them. The preparation of foods for the sick and the manner of serving may become very interesting subjects to both patient and nurse, if the nurse has the knowledge attained through a course of Domestic Science as given in most Public Schools, and will apply that knowledge when helping to care for the sick in the home. No other special training is necessary to apply the principles of cooking to invalid cookery.

Dietaries are classified, to assist nurses in caring for their patients, as liquid, soft, light, and full diets.

A *liquid diet* includes milk, beef tea, broths, beef juice, strained gruels, eggnogs, cream soups, cocoa, and all other liquid foods. Tea and coffee must be avoided.

This diet is used in the first day or two in a severe illness, where it is necessary to rest the organs of digestion.

This diet is consequently low in caloric value, ranging from 100 to 200 Calories.

A *soft diet* includes dishes in the liquid diet and also milk toast, soft-cooked eggs, jellies, boiled custards, junkets, ice cream, apple sauce, and cereals, and contains about 2,000 Calories a day including a little over 79 grams of portein. These foods must all be very easily digested and prepared in such a way that they will appeal to the appetite in spite of the sameness in texture.

An invalid tray (as served in the home), showing a full diet consisting of lamb chop, stuffed baked potato, spinach, bread, strawberries, milk and tea.

A *light diet* includes soft-cooked eggs, baked custard, creamed toast, sweetbreads, asparagus, scalloped oysters, gelatin jellies, baked apples, stewed prunes.

A *full diet*, includes soups, meat, fish, eggs, cereals, vegetables, fruits and desserts that are easily digested.

A full diet, or house diet, is used for patients whose digestive conditions are normal and whose inactivities are due to sprain or broken bone, etc. The diet containing 2,000 to 2,200 Calories or 80 to 90 grams of protein would be adequate to their requirement.

Some laxative foods should be included in all diets, and

all foods should be prepared in the best possible manner to enable easy digestion.

Rich foods and fried foods must not be included in any of the diets for sick or convalescing patients.

Special diets are ordered by a physician for special cases. and must never be given without such orders.

These include some of the following cases:—

1. A diet high in Calories required at times in cases of fever. The diet may be liquid but contain much milk, cream, and sugar to overcome the rapid breaking down of the body tissues in metabolism.

2. A diet high in protein is required at times during convalescence, when the body protein has been greatly reduced by fever during the illness.

3. A diet low in protein consists mainly of carbohydrates and is used in cases of chronic intestinal trouble where the protein of the normal diet causes considerable putrefaction.

4. A diet high in carbohydrates increases body weight.

5. A diet low in carbohydrates where both starch and sugar are restricted is useful in diabetic cases or where there is an overabundance of fat.

6. A diet high in fat is used for increasing body weight where the energy requirement may be increased or in cases of chronic constipation.

7. A diet low in fat is used for cases where there is a great deal of acid in the stomach, called acidosis. This diet eliminates most of the fat foods, such as butter, fat meats, and mayonnaise dressing.

8. A diet low in salt and red-blooded meats (which contain meat extractives) is used in cases of high blood pressure.

9. A diet rich in mineral salts of iron and calcium is used in cases of anaemia in growing girls and in the feeding of young children.

10. A diet low in roughage or cellulose matter and one easily digested is used for cases of chronic diarrhea.

11. A diet high in roughage including fresh fruit and vegetables, whole grains, etc., is used to overcome constipation tendencies. The protein in such cases should be reduced.

12. A diet rich in vitamines is essential in all cases of illness, convalescence, or normal health, and every diet should be planned to include some foods rich in vitamines.

Rules for serving invalids:—

1. Cook all food carefully and thoroughly.
2. Serve hot food hot and cold food cold.
3. Serve food daintily and attractively.
4. Use the prettiest dishes and the best linen.
5. Put a flower or a small plant on the tray to make it attractive.
6. Plan to have surprises for the patient in the kinds of food as well as in the ways it is served. This attraction helps to create an appetite, which often is lacking.
7. Always remove all bottles and sign of medicine from the sight of the patient, and remove the tray as soon as the patient has finished eating.
8. Be sure the room is well ventilated and the patient is comfortable before bringing in the food tray.
9. Be cheerful and ready to attend the wants of the patient while the meal is being served.
10. See that everything necessary for the service of the meal is on the tray, salt, silver, napkins, water, etc.
11. Use some topic of conversation outside the sick room, with patients who are convalescing, and refrain from conversation in cases of extreme illness.

QUESTIONS AND PROBLEMS

1. Name the diets used for the sick and convalescent.
2. What is meant by convalescent?
3. When is the liquid or fluid diet used?
4. What would you include in a light diet?

5. What foods rich in vitamines could be used in a light diet?
6. What special diet would be good to use for an anaemic girl? Name the foods used in this diet.
7. Why are these same foods of value to young children?
8. In fever what type of foods should be used? What avoided?
9. How would you cook eggs for a sick person?
10. Why are custards a valuable food in soft diet?
11. How does serving of food attractively help its food value?
12. Should cost of food be considered in feeding of sick persons?
13. Would the cover on an invalid's tray be similar or different than a cover for a well person at table?
14. What special foods are helpful in some special diseases?
15. Does a sick person need more carbohydrate foods than proteins or more proteins than carbohydrates?
16. Why should one not talk of his illness to a patient?
17. How does a domestic science course help a nurse?

APPLICATION

Make out a dietary for one day for each kind of diet. Discuss these and compare as to the energy requirement and the proportion of protein, carbohydrate, and fat.

Set a cover on a tray for an invalid (using a soft diet) for breakfast, for dinner.

These recipes are for individual portions suitable for one patient and for two girls working together in practice work in the kitchen.

1. Dry Toast

Method.—Slice stale bread in ⅓ inch slices, remove the crusts, place in a toaster and dry thoroughly, turning occasionally. Toast a golden brown on both sides. Spread lightly with butter. The starch is dextrinized and made more easy of digestion by toasting.

2. Milk Toast

2 slices dry toast
½ tbsp. butter
¾ c. scalded milk
¼ tsp. salt

Method.—Butter the toast, arrange on a hot dish, pour the hot milk over it, and sprinkle with salt.

3. Water Toast

2 slices dry toast
1 c. boiling water
½ tbsp. butter
¾ tsp. salt

Method.—Drop the slices of toast separately into the boiling water, remove to a hot dish, spread with butter, and serve at once.

4. Oatmeal Jelly

⅓ c. rolled oats — 1½ c. boiling water
Pinch of salt

Method.—Add the oats gradually to the boiling water, add the salt, boil 2 minutes, and then steam in a double boiler 45 minutes to 1 hour. Force through a fine strainer, mold, chill, and serve with sugar and cream.

5. Cracker Gruel

1 tbsp. cracker crumbs — ¾ c. milk
Pinch of salt

Method.—Scald the milk, add the cracker crumbs, and cook over boiling water 10 minutes; season to taste.

6. Eggnog

1 egg — Flavoring of nutmeg or vanilla
¾ tbsp. sugar — ⅔ c. cold milk or hot beef broth
A few grains of salt

Method.—Beat the egg slightly, add the sugar, salt, and the liquor, and then the milk gradually. Strain, and serve.

7. Eggs in a Nest

1 egg — 1 tbsp. butter
1 slice of toast — Pinch of salt

Method.—Separate the yolk from the white of the egg, beat the whites until stiff, sprinkle with salt, and heap on a slice of toast. Make a depression or nest in the center, drop into this the whole yolk, place in a pan in the oven for 2 minutes. Place a tiny piece of butter in the center of the nest and serve at once.

8. Beef Juice

Method.—Broil a small piece of round steak, cut it into small pieces, squeeze the juice from it into a cup, season with salt, and serve.

9. Beef Extract

Method.—Cut round steak into small pieces. Put into a sterile canning jar, cover and place the jar into a kettle of cold water. Heat the water gradually and keep at a temperature of 130° F. for 2 hours. Turn meat from the jar and press until the juice is extracted. Season the juice with salt, and serve.

10. Beef Tea

1 pound of beefsteak cut from the round — 2 c. cold water
Salt to season

Method.—Prepare the beef as for beef extract, put in a sterile jar or double boiler, add cold water and heat gradually, keeping the tem-

perature at 130° F for 2 hours. Increase the temperature at the end of that time until the liquid becomes a chocolate color and the albuminous juices are slightly coagulated. This removes the raw taste of tea. Season with salt.

11. Mutton Broth

2 pounds of mutton from the neck
4 c. cold water

Method.—Cut the meat in small pieces, soak in water 1 hour. Simmer for 3 hours, strain, and remove the fat. Three tablespoonfuls of rice may be boiled and served with the strained broth.

HOME APPLICATION

1. If there are any patients in the home, arrange the tray and help prepare the foods.

2. Plan a day's dietary for the patient. Consider the nature of the disease, the strength of the patient, and give reasons why you have chosen the foods and quantities that you have planned.

LESSON 55

DINNERS

Menus—Serving

Dinner is the heartiest meal of the day and usually contains food in some form representing each of the four food classes. In planning the menus for a day the dinner plan should be considered first. This then is followed by one for the breakfast the next day and the lunch. Thus a working plan from one morning to another is provided and, if help is employed, sufficient directions may be given one morning to suffice until the next.

When unexpected guests arrive but little adjusting of the plan is required except perhaps an addition of a vegetable or a simple salad or entree.

TYPE OF MENUS FOR DINNER

Type I	Type II	Type III	Type IV
Meat	Soup	Soup	Soup
Vegetable	Meat	Meat	Meat
Bread	Vegetable	Two vegetables	Two vegetables
Dessert	Bread	Bread	Salad
Beverage	Dessert	Dessert	Bread
	Beverage	Beverage	Dessert
			Beverage

The meat dish is the basis of the dinner plan and must be decided first. This decided, the vegetables which accompany the meat selected may be planned for, followed by the soup and dessert.

The menu charts on pages 419-420 are aids in selecting the accompaniments to the meat dish.

Choice cuts of meat are expensive and should be used in moderation. Cheap cuts which supply more nutriment for less cost may be prepared in many ways and serve the same purpose as expensive cuts. On account of the longer time required it is best to cook such meats in water or steam.

Some persons find they are better when meat is served only three or four times a week; others require it at least once every day, but only active workers should have it more than once a day.

In the light dinner menus for sedentary individuals, light meats, as beef, lamb, poultry, are better than too much fat meat and pork. Active workers can use more of the heavy meat dishes in cold weather, but too much pork is never good.

Most any of the cuts of meat are adapted to the dinner menu and there are endless ways of preparation. Beef is the standard meat and furnishes more food value, along with mutton, than any other meat. Fowl and fish are easier of digestion and make pleasing additions to the diet.

Meat substitute dishes take the place of meat in any menu and should never be served along with meat.

The soup at dinner serves to stimulate the digestive organs rather than to furnish any food value. This should be well seasoned and hot, and free from fat. Many soup accessories are served, such as crackers, croutons, bread sticks, etc.

Stock soups, as consommé, bouillon, vegetable, with meat as their basis, are best for dinner. These may be made of many combinations of beef, fowl, and vegetable. A vegetable soup without meat is also good. The cream soups, as pea, bean, lentil, are not suitable for dinner, as their food value is very high. These make excellent luncheon soups, when protein material is lacking and the other dishes of the meal are lighter.

The soup in types II, III, and IV may be replaced by a fruit or fish cocktail, if desired. In a formal dinner a cocktail precedes the soup, making an additional course.

The vegetable which is commonly used is white potato in the North and rice or sweet potato in the South. Rice, hominy, and macaroni used occasionally in place of white

potato make a good variety, but should not be used at the same time with white potatoes. Plenty of fresh fruit and vegetable should be served also to make up for the lack of mineral salts furnished by potatoes. When two vegetables are served, never serve sweet potatoes with white potatoes. Select one fresh succulent vegetable, if possible. There is no better way of introducing mineral salts, vitamines, and bulk in our food than with fresh vegetables every day.

Where season and market prohibits the use of fresh ones, canned or dried may be used. Two of the same class and nature, as peas and beans, should never be served at the same time. Neither should two creamed vegetables appear at one meal. One creamed, one baked is better. In the foundation menus, Dinner I contains only potato with meat. Dinners III and 1V have additional vegetables. The vegetable in type II may be served cooked or fresh in a salad. In type III one vegetable is served hot and the other as a vegetable salad. The selection of these depends mainly upon the meat selected. If a heavy meat is served, a light vegetable accompanies it and *vice versa.* Compare the beef and pork dinners suggested in the chart.

Breads may be quick breads or yeast breads. The yeast breads are best for the children.

Salads for dinner should consist of fresh vegetables or fruits with crisp salad greens (lettuce, endive) served with a good dressing. Heavy salads of meat, fish, and egg should furnish a main dish at luncheon or supper.

Desserts for dinner should be light puddings, fruit or ices, depending on the nature of the meat and vegetable courses. If these are heavy, then a very light dessert, simple fruit or ice is better. If the meat dish is a substitute dish, then one of the egg puddings, as custard, or a heavier dessert may be chosen. Desserts which require little preparation, as fresh or canned fruit, aid in lessening the work where other household cares are necessarily

DINNER AIDS IN MENU BUILDING

Meats	Vegetables	
	Starchy	Succulent
I. Beef roast (ribs, flank, rump).	Browned or mashed potatoes, hominy, parsnips, Yorkshire pudding, rice.	Cabbage, tomatoes, onions, spinach
II. Beef pot roast, loaf, stew.	Mashed potatoes, rice, macaroni.	Carrots, turnips, onions, squash, peas.
III. Steaks, porterhouse, tenderloin, hamburg, swiss, round.	Baked potatoes or au gratin potatoes, corn, parsnips, artichokes, potato borders.	Asparagus, tomatoes, cauliflower, green peppers, mushrooms.
IV. Sweetbreads, liver, tripe, tongue, chartreuse.	Rice, white potatoes, peas, lima beans, string beans.	Spinach, beets, celery, onions, carrots.
V. Lamb, mutton, roast, chops, stew.	Baked potatoes, rice, hominy, peas.	Beet greens, spinach, onions, Brussel sprouts, squash.
VI. Veal, roast, chops, cutlets, birds, loaf.	Sweet potatoes, glaced, eggplant, corn, peas, mashed potatoes.	Asparagus, cauliflower, onions.
VII. Pork, roast, chops, tenderloins, spare ribs.	White potatoes, parsnips, rice with tomatoes, bread dressing.	Onions, stewed apples, apple sauce, sauer kraut.
VIII. Ham, baked, fried, loaf casserole.	Baked potatoes, scalloped potatoes, hominy, string beans.	Spinach, dandelion greens, stuffed onions, cauliflower in cream.
IX. Chicken, fried, roasted, fricassee, or pot pie.	Sweet potatoes, peas, wax beans.	Brussel sprouts, cauliflower, stuffed peppers.
X. Fish, baked, fried, scalloped, finnan haddie.	French fried potatoes, corn, rice, macaroni, potato balls.	Tomatoes, beets, stuffed peppers.
XI. Oysters, lobsters, clams	Same as X	Same as X
XII. Turkey, duck, goose, venison.	Mashed potatoes, corn, hominy, bread dressing, peas.	Tomatoes, squash.
XIII. Meat substitutes, cheese or nut loaf, baked beans, macaroni and cheese.	White potatoes, rice, spaghetti.	Cabbage, tomatoes, onions, squash.

DINNER AIDS IN MENU BUILDING—Cont.

Soups	Bread	Salad and Accompaniments	Dessert	Beverage
Clear tomato, Celery, spinach, vegetables.	Bread or rolls.	Lettuce, cucumber, fruit, olives, asparagus.	Fruit ice, canned fruit, apple tapioca.	Coffee or tea
Noodle, vegetable, celery, chicken.	Bread or rolls.	Lettuce, romaine, watercress, cucumbers, tomatoes, cabbage slaw.	Rice pudding, berry short cake fruit.	Coffee or tea
Asparagus, clear tomato, chicken with rice.	Hot bread, biscuit.	Same as I and II.	Tapioca puddings, short cakes, berry pies, sherbets.	Coffee or tea
Noodle, clam broth, ox tail, clear tomato.	Biscuit or muffins.	Apple and celery, head lettuce, thousand island dressing.	Cup custards, choc. cream, pastry	Coffee or tea
Vermicelli, vegetable, consomme.	Rolls or biscuit.	Cold slaw, mint jelly, fruit salad.	Apricot or peach ice.	Coffee or tea
Bouillon, consomme, vegetable.	Bread, rolls.	Head lettuce, tomato, cucumbers.	Quick steamed pudding. pastry	Coffee or tea
Consomme, Julienne.	Bread.	Apple, celery, lettuce, French dressing.	Fresh fruit, ices.	Coffee or tea
Consommé.	Bread.	Same as VII.	Baked apple, fruit jelly, date pudding.	Coffee or tea
Clear tomato, bouillon, celery.	Biscuits, rolls.	Cranberry jelly, fruit, vegetable	Short cakes, fruit souffles, ice cream, cake.	Coffee or tea
Bouillon, celery, tomato.	Bread.	Green peppers, lettuce, cucumbers, French dressing.	Prune whip, snowball, pudding, apple sauce.	Coffee or tea
Consomme, cream tomato.	Rolls.	Waldorf, lettuce, French dressing, cabbage, slaw.	Cornstarch pudding, sherbets.	Coffee or tea
Oysters, cream asparagus.	Rolls, biscuit.	Apple salad, apple sauce, currant jelly, fruit salad, grape jelly.	Sherbets, parfaits, pastry, short cakes.	Coffee or tea
Cream tomato, cream pea, vermicelli.	Biscuit or cinnamon rolls.	Same as X.	Custard pie, steamed puddings. gelatin desserts	Coffee or tea

heavy, and are better than rich pastries. When rich desserts are served to the adult members of the family, some simple dessert should be provided for the children.

The beverage for the home dinner may be served to suit the tastes of the family, either with the meat course or not until the dessert course. Many prefer the hot beverage served with the dessert at the table. In formal dinners the hot beverage is always served last either with the dessert or afterwards and is usually served from the kitchen. It may be served in large cups, but the after-dinner small cups or demi-tasse are always served clear with sugar.

Milk or cocoa should be provided for the children with the main course of the dinner.

Cheese and Bonbons.—For the more formal dinner cheese and water crackers may be served as the last course with the clear after-dinner coffee. The soft cheeses of strong flavor such as Camembert or Neufchatel are best for this purpose.

Bonbons and salted nuts are usually served at the close of a formal dinner also.

The dinner chart which precedes is given to serve as an aid in building menus. Several dishes of like nature are grouped together, any one of which may be selected and the things which are suitable to serve with it are suggested. Only one dish from each column should be selected in one menu, that is, one meat, one vegetable or one salad and so on, depending on the choice of meats in the dinner menu. The type of menu will determine the choice of dishes and what to serve with them.

When using the chart to build a dinner of Type I, the soup suggested should be omitted. When building a menu for dinner of Type II, where only one vegetable is used, those vegetables suggested as starchy should be used and the succulent ones omitted. A salad or a succulent vegetable may be added in a Type III dinner.

Suggested dishes are taken from text.

The Setting of the Dinner Table.—The table appointments for dinner are more formal than for either of the other meals of luncheon or breakfast. The table is usually covered with a tablecloth for dinners.

A pad or service cloth must be used under a tablecloth next to the table. It deadens the sound and gives the linen a firmer and better appearance, as well as keeps the table from becoming marred. Asbestos pads can be purchased to fit the top of the table, or use heavy table felt or Canton flannel.

Linens must be absolutely spotless, carefully laundered, and plainly folded. Use pure linen or damask cloths and napkins of as good quality as can be afforded. A coarse linen is better than a mixture of cotton and linen.

Avoid linen that is stiff and that crackles when bent, as it has been starched to give it a better appearance.

Good damask has an elastic texture. German linens are very desirable and come in good patterns, but are not as pure white as the Irish linens. Tablecloths that come in patterns are more satisfactory than those that come by the yard, and there is but a slight difference in the prices of the two.

Napkins to match should be bought with each tablecloth. Avoid extreme sizes. The standard sizes for dinner napkins run from 22 to 27 inches.

To spread the tablecloth, put the single crease of the cloth directly in the center of the table, lengthwise, with the fold straight with the table. Crease the cloth slightly around the edge of the table that it may drape smoothly. The cloth should be wide enough to hang over the edges of the table a quarter of a yard.

A centerpiece of white linen either embroidered or trimmed with lace, is used in the center of the table. On this place a bowl or vase containing flowers or ferns.

Candlesticks of either glass or silver with candles of the

same color as the flowers may also be used to add to the attractiveness of the dinner table for some occasions.

Dishes and Silver.—Use the best china that can be

A simple dinner of three courses as served without a maid, showing dinner table as guests are seated, showing first course on the table.
Menu: Consommé, crackers, radishes and celery.

Detail of cover of first course.

afforded. White china or china having a delicate design is the best. Never use two kinds for the same course, but different patterns may be used for different courses. Select good styles, and if only a limited number of dishes can be

had, buy from open stock and get dishes that may be used for the most purposes. Knives and forks should be medium size and of a simple pattern that cleans easily.

The cover for dinner should include all the necessary silver to be used by each guest during the meal and should be in place when the dinner is announced. As in other meals the silver farthest from the plate is that used for the first course and that nearest the plate is that used for the last course of the meal regardless of the size.

Serving the Dinner without a Maid.—Dinner without help must be simple and more informal than when help is available. Three courses are usually as much as can be managed successfully and are sufficient for the average dinner. These consist of soup, meat course, and dessert.

If a fourth course is desired for special occasions, either a fruit or fish cocktail may be served preceding the soup course; or a salad course may be served after the meat course. When a salad is served with the three-course dinner, it is a simple one served with the meat course.

Before dinner is announced the first course should be on the table at each cover. Soup is served in individual dishes set on the service plate and should be very hot when served so that it will not be too cool. Wafers may be served on the side of each soup dish or placed on one plate to be passed. Celery, olives, radishes and any accompaniment to the course must also be on the table.

The service plate is a large plate at each cover upon which the cocktail or soup dishes stand. It remains on the table until the meat course is served, being removed before the dinner plate is placed. For the home dinner, when used, it may be removed at the same time the soup plate is removed.

After all the dishes from the first course are removed, the meat platter is brought in first, followed by the vegetable dishes for the main course. The meat is set directly

Second course of dinner, ready to serve, showing host's cover, also salad service in front of hostess.

Menu: Fried spring chicken, new peas, new potatoes with minced parsley, Parker House rolls, and stuffed tomato salad.

Detail of cover of second course, after host and hostess have finished serving.

in front of the host at the top of the cover within easy reach. The plates, in a pile, are set in front of him.

The platter for the meat must always be large enough to make serving easy. For a large fowl an extra platter or plate may be be of assistance in serving. Dressings and carved portions may be laid on it to make more room.

If a vegetable is served in small dishes, the hostess or some member of the family may serve it. The vegetable dish and small dishes are placed before the one whose duty it is to serve them.

If the salad is served with the meat course, the most

Dinner table, after dessert course has been served. Menu: Strawberry parfait, small cakes, and coffee.

attractive way is for the hostess to serve and dress each plate. A large bowl with all the salad materials prettily arranged in separate groups, ready to be assembled on each salad plate, is placed before the hostess, together with the salad plates and dressing materials. The art of arranging the salad at table is soon mastered and adds a bit of charm to the home dinner which any hostess will welcome. The dressing may be served from an attractive bowl or a French dressing may be prepared at the table by the hostess. French dressing bottles are convenient and attractive.

Water glasses should be refilled between courses.

A second helping may be offered guests at the informal home dinner—never at a formal dinner. Do not insist on guests' taking a second helping, if they decline the first invitation.

When the course is finished by everyone, the one who serves rises and removes the dishes according to rules 14 and 15. Soiled dishes left in the dining room detract from the dessert course. It is always best to remove all dishes of preceding courses from the dining room before serving the dessert. Piling on a side table is not a time saver. One moving of dishes is best.

Crumbing is seldom necessary at informal dinners.

Desserts are best served at table by the hostess. The large bowl or plate with the dessert and individual dishes are set at the hostess' place—at the right side. The coffee tray service is set in front at the top.

The hostess then pours the coffee or tea, as the case may be, and the cream and sugar may be added by her or passed. The dessert is then served.

Finger bowls are seldom used for the informal dinner.

Serving the dinner with a maid is practically the same as serving the luncheon with a maid. The maid stands at the left-hand side of the host when the service of the plates is in progress and assists in placing each plate when served before each guest. In the same manner the maid assists the hostess in the service of the beverage and the salad and dessert in turn when served by the hostess. It is her duty to attend to the wants of each guest quickly and quietly and be ready and available when needed without undue delay or need of being called each time.

The formal dinner with a maid consists of many courses, and is served between the hours of 6 and 8 P. M. The courses consist of (1) Fruit or oyster cocktail, (2) Clear stock soups and relishes, (3) Fish fillet, (4) Entree, (5) Meat

course with one or two vegetables and an ice, (6) Salad, wafers, (7) Dessert—sherbet, mousse, cake, (8) Coffee, cheese, nuts or bonbons. Coffee is served clear at the last in small after-dinner cups.

If the Russian style of serving prevails, most dishes are served from the pantry and placed in front of each guest by the waitress. The meat course may also be served from the pantry, if many guests are present.

Invitations to dinner or luncheon should be made several days prior to the day of the engagement. An invitation should be accepted or declined as soon after the invitation as possible, so that the hostess will know definitely and may plan accordingly.

If an invitation is accepted, only cases of illness or very urgent business should prevent keeping the engagement. Guests should be prompt in arriving about five to ten minutes before the hour named. To be late for a dinner or luncheon is a very grave offense for which there is seldom an excuse.

QUESTIONS AND PROBLEMS

1. How do dinner plans differ from luncheon plans?
2. What proportion of Calories each day should be furnished by the dinner?
3. Why is it best to plan three meals at one time, beginning with the dinner, than to plan for only one meal at a time?
4. Which meal is the basis for the day's dietary?
5. Which meal is the one to best balance the Calories and foodstuffs?
6. What kind of soups are best for dinner?
7. Why are the vegetables served with beef different from those served with pork?
8. Why are vegetables served for dinner best prepared with seasonings and melted butter than with White Sauce?
9. What kind of salads are best for dinner?
10. Name two desserts good to serve with a meat substitute dinner.
11. Name two desserts suitable to serve with a ham dinner.
12. Why is there any difference in desserts served with these two dinners?

APPLICATION

1. Each girl plan a dinner for each type of menu, I, II, III, and IV.
2. Compare menus and check with the score card for menus as in the luncheon plans.
3. Arrange the class in pairs for the dinner work to follow. Each pair should plan, buy, prepare, and serve at least one dinner and act as host and hostess. The entire work of the semester to be carried out along the dinner and meal plan, using the subject matter of the lesson in the text as a part of each dinner menu served.
4. Review table appointments, serving, etiquette, etc. Make all plans and proportion a definite sum to be spent for the dinners. The girls in charge of each dinner must keep within that allowance.
5. Estimate the number of Calories for each dinner.

HOME PROJECTS

1. Plan dinners at home for the following week. Prepare the meats and vegetables and be sure that the combination of dishes is correct.
2. Work out the number of Calories required by each member of the family and see whether you can plan the home dinners to furnish the correct number of Calories needed.
3. Take last week's menus and see how they measure up by the score card for dinners and for number of Calories required. Then change them to be correct.

LESSON 56

FISH

Place in Dinner Menu, Baking, Broiling, Frying

Fish is next to meat in importance as an animal food. Fish contains albumin, gelatin, fat, mineral matter, and water.

COMPOSITION OF FISH (Dressed for Market)

Kinds	Refuse	Protein	Fat	Carbo-hydrate	Mineral matter	Water
	%	%	%	%	%	%
Black bass	46.7	10.3	.5	——	.6	41.9
Cod, salt, boneless	——	22.2	.3	——	23.1	54.4
Halibut	17.7	15.1	4.4	——	.9	61.9
Mackerel	34.6	13.7	6.2	——	1.0	44.5
Perch	62.5	7.2	1.5	——	.4	28.4
Pickerel	35.9	11.9	.2	——	.9	51.1
Pike	30.5	13.0	.4	——	.7	55.4
Salmon	39.2	12.4	8.1	——	.9	37.4
Shad	50.1	9.2	4.8	——	.7	35.2
Smelts	41.9	10.0	1.0	——	1.0	46.1
Trout, brook	37.9	11.7	1.3	——	.7	48.4
Trout, lake	35.2	12.4	6.6	——	.8	45.0
Whitefish	53.2	10.3	3.0	——	.7	32.5

Kinds.—Fish are classified as *vertebrates*, or fish proper, having a blackbone, and *shellfish*. Those having a backbone are divided into two classes: white fish and oily fish.

In the white-fleshed fish, the fat is found only in the liver; in oily fish, the fat is found throughout the body.

White-fleshed fish include whitefish, cod, perch, pickerel, sunfish, smelts, crappies, soles, brook trout, pike, and black bass. Oily fish include salmon, lake trout, shad, herring, mackerel, halibut, and eels.

Structure of Fish.—The flesh of fish is made up of bundles of fibers similar to those of meat, but there is so little connective tissue that the bundles of fibers are not held together as firmly as in meat and can be easily pulled apart.

Food Value.—Fish is like meat in nutritive value, and may be substituted for it in the diet. It is not, however, so satisfying and stimulating as meat, largely because it contains less extractives. Fish belongs to the proteins; it contains a varying amount of fat and practically no carbohydrates. In general, the fuel value of 1 pound of fish is about equal to ⅓ pound of meat.

Digestibility.—In general, fish is easily digested, varying with the amount of fat and coarse fiber present. White-fleshed fish, excepting the cod, is more easily digested, but less stimulating, than oily fish. Cod has coarser fiber than other white-fleshed kinds.

Freshness is the all-important quality in fish. Fish decomposes quickly and there is greater danger from ptomaine poisoning than in other foods. In fresh fish

The gills are bright red and clear.

The eyes are bright and full.

The flesh is firm, the tail not drooping.

The scales do not come off easily and there is no disagreeable odor.

To Clean Scaly Fish.—Fish are cleaned at the market, if so ordered. Remove the scales by working a knife over the fish, beginning at the tail and drawing the knife towards the head. A special tool may be purchased for this purpose. If the fish is to be used at once, dipping into boiling water and removing immediately loosens the scales. Wash the fish thoroughly inside and out with a wet cloth, then dry on a clean cloth. Leave the head and the tail on for baking whole.

To Skin a Fish.—With a sharp knife slit the skin along the entire length of the backbone. Remove the fins. Loosen the skin by working carefully with a small knife, beginning at center of the back and working along one side around the fish. Then turn it over and loosen the skin on the other side.

To Bone a Fish.—After the fish is skinned begin at the

tail with the boning knife and separate the flesh from the backbone on each side. Follow the ribs and work carefully towards the head. The entire backbone and the ribs will all come out together. See that all the little bones are removed.

Methods of Cooking Fish.—The application of heat, as in broiling and baking, is the best method of cooking fish. They may also be fried, sautéd, or boiled. White fish may be fried, but oily fish rarely. Since fish contains albumin, cold water and boiling water have the same effect on it as on meat and egg white.

Fish require moderate temperature in cooking for only sufficient time to soften the connective tissue. Fish contains much less connective tissue than meat, and, therefore, is cooked in a much shorter time than meat. Fish may be cooked by the same methods and for the same reasons as for cooking meats.

1. To soften connective tissue.
2. To improve appearance and flavor.
3. To retain the juice as in baking, broiling, boiling, sautéing, and frying.
4. To extract the juice as for soup.
5. To retain some juice and extract some as in stewing, which results in a thick soup, and has additions of fish flakes and vegetables, and is called chowder.

Large fish are suitable for baking whole, the stuffing and the sauce usually served with it supplying food elements that the fish lacks.

Oily fish and those that are of small size are usually broiled. Boiling is a rather wasteful way of cooking fish.

Large pieces of cod, and salmon, sometimes trout, may be boiled.

Use of Fish in the Dinner Menu.—Fish may be used in place of meat to give variety in flavor and food combinations. Fish requires some acid sauce to round out the flavor, and is usually accompanied by slices of lemon as a garnish.

QUESTIONS AND PROBLEMS

1. Why may fish be used in a dinner menu in place of meat?
2. What does meat contain that fish has in a slight degree?
3. How does the structure of fish compare with that of meat?
4. How does the digestibility of fish compare with that of beef?
5. Why should fish be fresh?
6. How are fish cleaned?
7. What are the methods of cooking fish?
8. Name two ways of preparing white fish for dinner.
9. How do these methods just named compare in digestibility?
10. How would you cook the following fish: Bass? Pike? Brook trout? Salmon? Halibut? Crappies? Lake trout? Mackerel?
11. What is the comparative cost of fish with meat?
12. In what way does white fish differ from oily fish?

APPLICATION (Baked Fish—Demonstration)

1. Baked Fish

Method.—Remove the scales carefully, clean, wipe, and dry the fish. Leave the head and tail on. Rub well with salt. Stuff with dressing and sew up with coarse needle and thread. Do not fill the fish too full, for the dressing expands during baking. Put fish on a fish sheet or on strips of cotton or bacon in the pan, which aid in removing the fish when done. Make three gashes on each side, alternating, and set in 2-inch strips of bacon to add fat to fish that lack it, as white fish. Skewer the fish into the form of the letter S. Sprinkle with salt and pepper and dredge with flour. Bake in the oven 30 to 45 minutes, basting every 10 minutes from 1 cup of hot water to which has been added ¼ cup of butter. When well browned, remove from the pan carefully to a hot platter and take out the skewers and strings. Garnish with parsley and lemon and serve hot with a fish sauce.

Dressing for Fish

1 c. stale bread crumbs	1 tbsp melted butter
½ tsp. salt	Pepper, a few grains
1 tbsp. minced parsley	Onion juice, a few drops

Water, enough to moisten slightly.

Method.—Mix the ingredients in the order given.

FISH SAUCES

Hollandaise Sauce

½ c. butter	Yolk of 2 eggs
½ tbsp. vinegar or	¼ tsp. salt
1 tbsp. lemon juice	Cayenne, a few grains

Method.—Wash the butter, separate it into three parts, and put one piece in the double boiler with the vinegar or lemon juice and egg yolks; stir constantly with a wire whisk. Add second piece of butter, and, as the material thickens, the third piece. Remove from the fire and add the salt and cayenne. If left over the fire a few seconds longer it will separate. If a richer sauce is desired, add ½ tablespoonful of heavy cream and ½ teaspoonful of hot water.

(*Housekeepers make full rule.*)

Drawn Butter Sauce

⅓ c. butter
3 tbsp. flour
1½ c. hot water
½ tsp. salt
⅛ tsp. pepper

Method.—Put half the butter in a pan; when bubbling, but not brown, add the salt, pepper, and flour and stir until smooth. Add the water and stir while it thickens. Add the remainder of the butter and stir until it is absorbed.

Tartar Sauce

½ c. mayonnaise dressing
1 tsp. parsley, washed and chopped
1 tsp. chopped pickle
1 tsp. chopped olives

Method.—Mix the parsley, pickle, and olives, and add them to the mayonnaise dressing.

2. Broiled Fish

Method.—Bluefish, cod, haddock, and mackerel are split down the back and broiled whole, removing head and tail if desired. Salmon, halibut, and lake trout are cut in inch slices for broiling. Smelt and other small fish are broiled whole without splitting, but the entrails are squeezed out carefully so as not to bruise the fish. Clean and wipe the fish, sprinkle with salt and pepper, and place in a well-greased wire broiler, cooking the flesh side first. Turn it and cook the skin until crisp. Sliced fish should be turned often while broiling, slip upon a hot platter, or place platter over fish and invert platter and broiler together.

Small fish require 10 to 15 minutes for broiling.

Large fish require 15 to 20 minutes for broiling.

3. Sautéd Fish

Method.—Prepare the fish as for frying, and cook in a frying pan with a small amount of fat. The fish may be dipped into cornmeal in place of flour. Smelts are best cooked in this way.

4. Fried Fish

Method.—Clean fish and wipe as dry as possible. Sprinkle with salt and pepper, dip into flour, corn meal or crumbs, into egg, and again

into crumbs. Fry in deep hot fat; drain on soft paper. Serve on a hot dish, garnishing with parsley and slices of lemon. Corn meal may be used in place of the flour.

MEAL PLANNING

Group 2 serve a dinner, type 2, using fish as the meat course. Plan vegetables and dessert to go with the fish used.

HOME PROJECTS

1. Prepare fish in some way for dinner next week.
2. Do the marketing for the week; and make your own selection of fish for the dinner. Tell what points influenced you.

LESSON 57

FISH

One-Dish Dinners—Left-Overs

Preservation of Fish.—Fish are preserved by salting, smoking, drying, or a combination of these, and by canning. Many fish are preserved in oil.

Cost.—Fish are never plentiful except in seaport towns or near lakes and rivers where they abound. They are very perishable and must be transported in refrigerator cars or frozen or preserved by one of the above mentioned methods. For this reason the price of fish is never very low, where fish is not easily available.

Left-overs.—Pieces of fresh or dried fish which have been cooked and are left over from a former dinner may be utilized in one of the many attractive dishes such as meat left-overs are used, and form the main dish for another dinner or luncheon. The fish may be broken up into small pieces and combined with the white sauce, or creamed fish on toast, croquettes, fish loaf, scalloped dishes, or, instead of the white sauce, a mayonnaise dressing may be used for a salad suitable in the light supper menu or for the main dish of the hot-weather dinner menu.

Canned Fish.—When fresh fish is not available to the extent of providing left-overs or when a change of flavors is desired, the canned fish flakes may be used or salmon, lobster, crab meat, or shrimp may be used in the same type of dishes. These add additional cost to the dinner menu, and possess such pronounced flavors that they are not suitable to very frequent repetition. These canned products are especially suited, however, to the reserve stock of foods to be kept on the emergency shelf, and are quickly and easily converted into almost any type of dish desired, for the main dish for dinner or an extra fish course

for more formal dinner, the hot or cold luncheon dish, or even the after-theater supper. Most any kitchen cupboard contains the necessary materials to use with and season any kind of dish made from these foods. Fish is used in the same manner in all dishes as left-over meat, with the one chief difference that, instead of being ground, it is flaked off or broken up with a fork into small pieces.

Serving Fish.—The choice of foods to serve with fish should be determined largely by flavor, although some carbohydrate food should naturally accompany all fish dishes. Care, however, must be observed to blend flavors and not to use two opposing or decided flavors at one meal. The fish should be the one pronounced flavor, and the other dishes and courses should be subsidiary to the main dish, using only such dressings and fish sauces that will round out the flavor of the dish.

Most fish are improved by the addition of tart, well-seasoned sauces. Fish should be served on a large platter surrounded by the accompanying starchy food (rice or potatoes as a border), with a second vegetable (arranged in a simple grouping suitable for easy service at table), and the fish sauce served separately from a small dish by each guest as desired.

A point of caution in regard to the serving of fish dishes when strangers are among your guests is to serve enough other foods with the fish to provide for the guest who has pronounced dislike for fish and leaves his served portion untouched. It is much the better plan, when guests are to be present, to serve other meat at dinner unless the guests have expressed a desire for some particular variety of fish or the local market is especially noted for its product.

Fish chowders are especially suited for the one-dish meal for supper or luncheon, since they usually contain all the food classes in the one dish and enough Calories to serve the specific body needs for the meal.

QUESTIONS AND PROBLEMS

1. How do salmon and halibut compare in price in market?
2. In what sizes of cans does canned salmon come?
3. How could you use 1 cupful of left-over fish flakes of pike or bass?
4. What kind of fish is used for chowder.
5. How does chowder differ from meat soup?
6. To what class of foods do the following dishes belong: Creamed codfish? Salmon loaf?
7. What would you serve with each of these dishes?

APPLICATION

1. Salmon or Tuna Loaf

1 can salmon or tuna	1 c. stale bread crumbs
2 eggs	½ c. milk
1 tsp. lemon juice	1 tsp. salt

Method.—Mince the fish and remove the bones. Add the bread crumbs, beaten eggs, and the milk. Season with salt and lemon juice. Put into well-greased molds and steam or bake 30 minutes. Turn from the mold, serve hot or cold with White Sauce, Sour Sauce, or lemon.

2. Codfish Puff

½ c. shredded codfish	2 eggs
1 c. potatoes diced	Dash of pepper
1 tbsp. butter	

Method.—Soak the codfish in cold water for 15 minutes. Shred it into bits. Pare and dice the potatoes, and cook with the codfish in boiling water until tender. Mash and add the butter and pepper. Beat well with a fork until the codfish is in fine threads. Beat the eggs very light and fold into the fish mixture. The mixture should be soft and creamy. Have an omelet pan hot. Grease the bottom, add the fish mixture, spread evenly about ½ inch thick and cook slowly until a brown crust is formed. Loosen the edges and roll one side over half way and turn out on a hot plate like an omelet.

3. Creamed Codfish

½ c. salt codfish	4 tbsp. flour
2 c. milk	2 tbsp. butter
Spk. of pepper	

Method.—Wash, pick the codfish into small pieces, and soak it a few hours in lukewarm water until soft. Drain and add to a white sauce made from butter, flour, pepper, and milk. The beaten yolk of an egg may be added just before serving. Serve on or with hot buttered toast.

(*Basis for 2 girls, ¼ rule*).

4. Halibut a la Creole

1 lb. halibut	2 whole cloves
1 c. tomatoes	2 tbsp. butter
½ c. water	2 tbsp. flour
1 slice onion	½ tsp. salt
1 tsp. sugar	Pepper

Method.—Cook the tomatoes, water, onion, cloves, and sugar together for 10 minutes. Melt the butter and add the flour and stir until smooth. Add the tomato mixture to the flour mixture, add seasonings and cook 5 minutes. Then strain. Wipe the fish with a wet cloth, salt it slightly and put in a baking pan. Add half of the tomato mixture and bake until the fish separates from the bone easily. Baste during the baking every 10 minutes. When done, serve on a platter with the remainder of the hot tomato sauce and add a piece of parsley as a garnish.

5. Chowder

1 lb. of white fish	1½ c. diced carrots
3 c. cold water	2 c. milk
2 slices salt pork	2 tsp salt
1 small onion	5 crackers
4 medium-sized potatoes	

Method.—Wash fish and cut in pieces off the bones. Cook the bones in cold water 20 minutes. Strain off the liquor into another pan. Cut the pork into small pieces and fry with the sliced onion, then add the hot liquor and vegetables and cook 20 minutes. Add the fish and cook 15 minutes longer at a moderate temperature. Add the milk and the crackers broken in small pieces and simmer 5 minutes. Serve hot. The carrots may be omitted and the fish may be varied.

MEAL PLANNING

Group 3 serve a one-dish dinner, using fish left-overs or canned fish as the main dish. Build the menu from recipes in the text.

HOME PROJECT

Prepare a one-dish dinner, using one of the recipes in this lesson.

LESSON 58

SHELLFISH

Oysters—Ways of Serving

The shellfish used for food are divided into two classes, (1) mollusks, and (2) crustaceans.

The mollusks include oysters, clams, mussels, and scallops.

The crustaceans include lobsters, shrimps, crabs, and crawfish.

OYSTERS

Oysters are the most commonly used shellfish. It has has been estimated that the approximate annual output of oysters in the United States is 25,000,000 bushels, which constitutes about ⅔ of the total world supply.

Source.—Oysters are found in shallow salt water, the supply for this country coming mostly from the Atlantic and Gulf coasts. They are cultivated in large quantities in the Chesapeake Bay.

Since oysters are found in shallow waters and along the shores, it is quite possible for the water in which they live to become contaminated by sewage and waste disposal. Oysters live on plant and animal life brought to them in the water. If the water in which they grow is impure, they are likely to become carriers of disease.

State and federal governments have laws to prevent or regulate the disposal of sewage in rivers and harbors where oyster beds exist.

Season for Oysters.—Oysters are in season from September to April, or in any month containing an R. Avoid them in hot weather, when they are flabby and poor.

Growth.—An oyster shell has two parts, connected by a hinge. The part on which the oyster grows is deeper and rounder than the part covering it. There are two strong muscles that open and close the shell. The oyster has

neither head nor tail, but has a mouth near the hinge end of the shell. Oysters spawn during the summer. One oyster lays millions of eggs in a season. Small oysters are planted along the coast, much as young fish are put into streams.

The length of time required for growth of the oyster depends largely on environment, but usually the oysters are marketed when 3 to 5 years old.

Food Value. The nutrient of the oyster is mainly protein. The protein, which is very delicate, is toughened by high temperature just as the albumen of the egg is hardened and toughened. Oysters are more easily digested when eaten raw than cooked. Bulk for bulk they compare favorably with milk in food value. The fat content is less, but the protein is greater. Compared with fish, the protein of shellfish is much less except in the case of shrimps. The eating of all parts of shellfish from a nutritive standpoint is superior to eating only the muscle parts of animals without their other tissues.

Composition of Shellfish

Kinds	Refuse	Protein	Fat	Carbohydrate	Mineral matter	Water
Clams	——	10.6	1.1	5.2	2.3	80.8
Crabs	——	7.9	.9	.6	1.5	36.7
Lobsters	61.7	16.4	1.8	.4	2.2	79.2
Oysters	——	6.1	1.4	.9	3.3	88.3
Shrimps	——	25.4	1.0	.2	2.6	70.8
Mussels	——	8.7	1.1	4.1	1.9	84.2

Blue points are small oysters so named because the first came from Blue Point, Long Island. They are regarded to be of extra quality.

To Open Oysters.—Run a thin knife blade under the back opening and cut forward through the strong muscle which holds the shell together. Then open the shell and remove the oyster.

To Clean Oysters.—Drain off and save the liquid from the oysters. Put the oysters in a strainer and pour cold water over them to rinse them. Pick over the oysters separately to remove any pieces of shell. Use the oyster liquid in stews.

OTHER SHELLFISH

Clams are similar to oysters. The hard-shell varieties are known as little-neck clams, and are served in the half shell, in coast towns. The soft-shelled clams are used more in New England.

Lobsters are abundant from June to September, but are used all the year. A lobster weighs about 2 pounds, and is 12 to 15 inches long. Lobsters are more difficult to digest than other shellfish. They are broiled or boiled.

Shrimps are in season from May to October, and are found more abundant in Southern waters, the best coming from Lake Pontchartrain. Canned shrimps are much used for salads.

Crabs are somewhat like lobsters, but smaller. When taken after they have just shed their shells, they are called "soft shelled" and are regarded as a delicacy.

COOKING AND SERVING SHELLFISH

Methods of cooking and serving:—

Oysters require a very moderate temperature, 160° to 180° F. for only a very few minutes to sufficiently cook them. They should be removed from the heat as soon as the body becomes plump and the edges curl. If cooked longer, they will be tough.

Oysters are served (1) raw, as in oysters cocktail or oysters on the half shell, or (2) cooked by broiling in half shell, baking in oven, or in the shell in hot ashes, stewing, steaming, and frying. The moderate temperature necessary in cooking them is not sufficient to destroy any bacteria which may be present, and for this reason many persons are afraid to eat oysters unless they are overcooked.

Frying is a popular method of cooking large oysters, and is regarded as a very nice way of developing the flavor. Like all foods, however, they become more difficult of digestion when enclosed in a coating of fat and should be served only to persons capable of digesting them.

For frying, the oysters are egged and crumbed in the same manner as croquettes, and require the same time for frying as uncooked mixtures.

Clams are prepared and served in the same manner as oysters.

Lobsters and crabs are broiled, boiled, creamed on toast with additions of high seasoning, or served cold in salads or as cocktails with cocktail accompainments.

Shrimps may be creamed, served in salad or as a cocktail.

Place in the Dinner Menu.—Raw oysters and clams when served for dinners comprise a first course at the formal dinner, and are served as a cocktail with a cocktail sauce, or served on the half shell on ice with lemon, horseradish, or cocktail sauce. Shrimp, crab and lobster are also used in cocktails. They may be served with drawn butter or cream sauce highly seasoned on toasted rounds of bread as a preliminary course preceding a meat course. When served with a cream sauce they may be used for luncheon or an evening supper as the hot dish.

Shellfish should always be fresh and firm, never mashed or soft, and thoroughly cold before serving for cocktails.

Oysters are used in soups or stews. These are not stews in the true sense, since they require only a few minutes cooking. Milk is the base of oyster stew, and it is not thickened as for other cream soups. Oyster stew may be used in place of meat in the dinner menu or as the hot dish for a lunch or supper, since the protein in the milk together with the oysters make it a protein-rich dish suitable for use in place of other meat. It contains too much food value to be served as the soup in a hearty dinner menu.

Scalloped or creamed oysters are suitable ways of serving for the main meat dish in the dinner menu.

QUESTIONS AND PROBLEMS

1. What substance in oysters requires a very moderate temperature in cooking?
2. What other foods you have studied also require moderate temperature? Why?
3. When are oysters cooked sufficiently?
4. How may shrimp or oysters be used as a first course for dinner?
5. What is the difference between ordinary oysters and Blue Points?
6. How could you serve oysters as a main meat dish at dinner?
7. How are oysters sold in your market?
8. What do oysters cost a pint?
9. Is there any difference in the flavor of fresh oysters from shipped ones?
10. Can you purchase fresh lobsters and crabs in your market?
11. How are these sold, by the piece or pound?
12. How does the digestibility of lobsters compare with that of oysters?

APPLICATION

1. Oyster Stew

2 c. milk (scalded)	1 tbsp. butter
2 c. oysters	⅛ tsp. white pepper
1 c. oyster liquor	Salt to taste

Method.—Pick over the oysters, wash in a strainer set in a bowl of water, removing any adhering pieces of shell. Heat the oyster liquor; then add the oysters and cook until the edges curl, which requires only a few minutes. Add the hot milk, butter, and seasoning, and serve at once. Oysters become tough if not served immediately or if overcooked.

2. Fried Oysters

1 doz. select oysters	½ c. cracker crumbs
1 tsp. salt	2 eggs
⅛ tsp. pepper	4 tbsp. water

Method.—Clean oysters and dry them thoroughly between two towels; season with salt and pepper. Roll in fine crumbs and then in beaten eggs to which has been added the water; then roll in fine crumbs again, and fry in a wire basket in deep, hot fat until nicely browned. Drain on a piece of plain paper. Serve hot, garnished with parsley or lemon, with cabbage slaw for a salad.

3. Creamed Oysters

1 pt. oysters — 1½ c. medium white sauce
⅛ tsp. celery salt

Method.—Clean and cook the oysters in their liquor till the edges curl; drain, and add to hot medium white sauce; add the celery salt. Serve on squares of toast, in timbale cases, or in toasted buns. Cut off top of bun, scoop out the center, leaving shell whole. Spread with butter, toast in oven, Fill with creamed oysters. Garnish with parsley and lemon.

4. Lobster a la Newburg

1 lb. lobster — ⅓ c. cream
¼ c. butter — 2 egg yolks
½ tsp. salt — Grating of nutmeg
Cayenne, a few grains — ½ tsp. lemon juice

Method.—Cut or break up the lobster meat into cubes. Melt the butter in a pan, add the lobster, and cook until thoroughly heated. Season with salt, cayenne, and nutmeg and add the lemon juice. Cook 1 minute; then add the thin cream and yolks of eggs well beaten, and stir until the sauce thickens. Serve on squares of hot toast, garnished with parsley and lemon.

5. Shrimp Wiggle

4 tbsp. butter — 1½ c. milk
3 tbsp. flour — 1 c. shrimps
½ tsp. salt — 1 c. canned peas
Paprika

Method.—Make a white sauce of the butter, flour, milk, and seasoning. Wash the shrimps, remove the dark vein, and break the shrimps into pieces. When the sauce thickens add the shrimps to it, also the canned peas drained from their liquor and thoroughly rinsed. Cook all 4 or 5 minutes and serve on squares of toasted bread. Garnish with parsley, and a stuffed olive.

MEAL PLANNING

Group 1 serve simple dinner type 1, using oysters in the main dish in place of meat.

HOME PROJECTS

1. Prepare oysters for one dinner in any method given in this application.
2. Plan and serve the other dishes which go well with oysters in a menu.

LESSON 59

POULTRY AND GAME

What to Serve with—Dinners

Poultry and game are generally classed together, since the same principles of cooking apply to both.

Poultry (the term applied to domestic birds used for food) includes: spring chickens, fowl, turkeys, ducks, geese, etc.

Game (the term applied to wild birds and animals used for food) includes: grouse, quail, ducks, venison, etc.

Food Value.—The light meat of poultry is tender, but poorer in flavor than the leg, a difference similar to the loin and the round of beef. The muscle fibers in the breast are short, more open, and less used, and contain little fat. The breast is tender and more easily digested than the dark meat. Poultry is not as rich in food value as beef, but is easily digested, very palatable and especially suitable for the sick. It does not produce some of the disorders that red meats are thought to do.

The meat of ducks and geese contains a large quantity of fat, and is, therefore, not as readily digested as that of chicken or turkey.

The meat from game, like that of poultry, is easily digested, but has much more pronounced flavor. The meat from the breast is also easier of digestion than that from the legs or back.

Selecting Poultry.—Spring chickens are those about five months old. A chicken over a year old is called a fowl. Poultry has a better flavor when full-grown than when too young.

The bird should be short and plump for its weight.

The skin should be clear and smooth, but not the smoothness due to scalding.

The legs should be smooth and the toes pliable.

The end of the breastbone should bend readily; it should not be broken. The breast should be plump.

Pin feathers indicate a young bird; long hairs and long sharp spurs, an old one.

Old fowls usually have a large amount of fat, and the flesh has a purplish tinge.

Dressing a Fowl.—All poultry should be dressed as soon as killed. The feathers come out easily when the fowl is warm and when stripped off towards the head. Remove the pin feathers with a knife, and singe the hairs by holding the bird over a gas burner or a lighted paper.

Cut off the head and the feet.

Turn down the skin of the neck and cut off the neck close to the body; remove the crop and the windpipe from the end of the neck rather than by a cut in the skin, which, if made, must be sewed up.

Remove the tendons in the legs by pulling out carefully one at a time, taking pains not to tear the flesh. The leg of the fowl is more tender if the tendons are removed.

Remove the oil bag in the tail.

Make an incision near the vent, and loosen the fat from the body of the fowl. Loosen everything before drawing out, so as to avoid rupturing any part. Insert the hand carefully between the walls of the body and the entrails and draw the entrails out, using care not to break the gall bladder on the liver. Be sure the lungs and kidneys are all removed from the hollows of the backbone. Wash thoroughly, holding under a faucet to rinse the inside well.

To clean the giblets: Detach the heart, liver, and the gizzard. Cut through the thick muscle of the gizzard and peel it off slowly without breaking through the lining inside. Cut the heart open. Remove the gall bladder very carefully from the liver. Wash all thoroughly and let soak in salted water before cooking.

To Stuff a Fowl.—Place the fowl in a bowl and stuff the neck until the breast is plump; then draw the skin over the neck and sew it firmly. Fill the inside of the fowl with the stuffing, and sew up with a coarse thread, taking large stitches.

To Truss a Fowl.—Draw the thighs close to the body, cover the legs over the tail, and tie firmly with twine. Fasten the wings to the body with skewers.

To Cut Up a Fowl.—Separate the legs from the body by cutting through the loose skin between the leg and the body, bend the leg over and cut through the joint. Pull out the tendons from the lower leg, or "drum stick."

Cut the neck off. Then separate the wishbone from the breast. Slip the knife inside the collar bone, and cut it free from the backbone, and then through under one wing to the center of the front. Then cut off the other wing in the same manner, thus making three good pieces of breast, with the wings attached to two pieces.

Cut the breastbone apart from the back. For a large bird cut the breast crosswise into two pieces of uniform size. If the bone is hard, a sharp knife or cleaver is necessary.

Cut the back into two pieces along the backbone.

Always divide the fowl at the joints smoothly. The method of chopping through the bones and making irregular pieces is not to be recommended. Pieces of uncertain character and difficult to cut are most disappointing.

Put the tips of wings, the neck, and rib bones that remain into a kettle and cover with water to make chicken broth. The bones that are left after serving may be added.

A chicken or fowl, when cut in this manner, contains five pieces of white meat (2 breast, 1 wishbone, 2 wings with collar bone attached) and 6 pieces of dark meat (2 drumsticks, 2 second joints, 2 backs) or a total of 11 good serving pieces in addition to the giblets, which may be served whole or used ground up for gravy.

The methods of cooking poultry and game are practically the same as cooking for meat. Young poultry and game, where the meat fibers are tender and the meat not very thick on the bones, are best broiled. They may be fried, sautéd, or baked in the oven. Older birds with thicker layers of flesh and harder fibers require a longer time for cooking and should be roasted, braised, fricasseed, stewed, boiled, or dry-steamed. The same principles of applying heat for retaining and extracting juices applies to all meat.

Fricasseeing is a combination of stewing and sautéing. The pieces of chicken are stewed until tender, then browned in a small amount of hot fat. The stock is thickened for gravy and served with the chicken.

Time for cooking:—

Broiling young chickens.....10-15 minutes
Sautéing or frying young chickens....20-30 minutes
Stewing chickens.....20-30 minutes per pound
Roasting chickens and turkeys.....20 minutes per pound
Roasting ducks and game.....25-30 minutes per pound

What to Serve with Poultry.—White or sweet potatoes, rice croquettes, celery, cucumbers, mushrooms, apple croquettes, cranberry jelly in molds, and bread, oysters or chestnut dressings are good to serve with poultry. With turkey, sage, chestnuts, oysters, or sausage are excellent flavorings for dressing.

What to Serve with Game.—Bread or apple dressings, currant jellies, spiced gooseberries or currants, baked or fried apples, or tart relishes.

QUESTIONS AND PROBLEMS

1. How does the breast meat of poultry compare as to structure and digestibility with the meat from the legs?
2. How does the meat from breast of chicken compare with that of breast of beef animal? With that of loin?
3. What makes the difference?
4. Would you class squab and pigeons as poultry or game?

5. How does poultry compare in price per pound with beef?
6. Which contains the most meat for the price?
7. If you were spending $3 for meat for a poor family for Thanksgiving, which would be the best for nutritive value, a beef roast, or a chicken?
8. How would you clean and dress a chicken?
9. What are the methods of cooking poultry?
10. Could you cook game the same way?

APPLICATION

1. Roast Chicken

Method.—Put dressed bird on a rack in the roaster, rub its entire surface with salt, and spread breast and legs with 3 tbsp. butter creamed with 2 tbsp. of flour. Dredge bottom of pan with flour. Roast in a hot oven, basting every 10 minutes until done. Use ⅓ c. melted butter in ⅔ c. boiling water for basting at first; later the fat in the pan may be used. Turn the bird frequently to brown evenly. If a thick crust is desired, dredge twice with flour. When the breast meat is tender, the bird is done. A 4-pound bird requires about 1½ hours for roasting.

Stuffing

1 c. stale bread crumbs
⅓ c. butter
⅓ c. boiling water
Salt and pepper
Powdered sage

Method.—Melt the butter, pour over the crumbs, add seasonings

Oyster Dressing

3 c. stale bread crumbs
½ c. butter, melted
Salt and pepper
1 pt. oysters

Method.—Mix in the order given, adding the oysters cleaned and drained from their liquor.

Giblet Gravy

Method.—Cook the giblets at simmering point until tender in enough water to cover. When well done put through a food chopper. Remove chicken from pan when done, drain off all the fat but 4 tbsp., add 4 tbsp. of flour and stir until smooth and brown. Gradually add the liquor in which the giblets were cooked and enough milk to make a medium thick sauce. Cook until smooth. Season with salt and pepper to taste and add finely ground giblets. Serve hot.

2. Fried Chicken

Method.—Wipe each piece of chicken with a clean, dry cloth; dredge with salt, pepper, and flour. Melt drippings of lard or lard

substitute and some butter in a pan. Have the fat deep enough to nearly cover the pieces of chicken. When hot, add the chicken and cook until brown, turning the pieces frequently to brown evenly. Allow about 30 minutes for young average-sized chicken. When all the pieces are well browned, reduce the heat, add about ¼ c. boiling water to the fat. Cover the pan quickly, and continue cooking until chicken is tender. The steam produced by the addition of water makes the chicken more moist and better flavored. Drain the chicken from the fat before placing on the platter. Then pour over it ⅛ c. melted butter to which has been added 1 tsp. finely chopped parsley. Only young spring chickens ought to be fried, as old birds require longer cooking.

3. Broiled Chicken and Small Game Birds

Method.—Split down the back. Break the joints, remove the breastbone, clean, and wipe with a dry cloth. Season with salt and pepper and rub well with soft butter. Put into a broiler or toaster and broil over a clear fire about 20 minutes. Spread with butter and serve hot. Garnish with parsley and lemon.

Note.—Prepare small game birds the same as young chickens, season and dredge with flour. Broil 10 minutes over clear coals or under the gas flame. Serve on buttered toast and garnish with parsley and current jelly. Very small birds require a quick hot fire for only a short time to brown them nicely on all sides. The cooking is sufficient when birds are well browned.

4. Fricasseed Chicken

Method.—Cut and prepare the chicken as for frying. Cover with boiling water, and add 1 tbsp. of salt and a little pepper. Simmer 2 or 3 hours, or until tender. Reduce the water until about a pint remains. Remove all the large bones, dredge with flour, salt, and brown in hot fat. Strain the liquor from the chicken, remove the fat, add 1 c. of milk or cream to the liquor, and reheat. Thicken with 2 tbsp. of flour, moistened with ¼ c. milk; add to the liquor. When the gravy or sauce is cooked and thickened, add to the chicken. Serve with or without hot biscuits.

5. Chicken Mousse

1 c. chicken	1 c. whipped cream
1 c. thickened broth	1 tsp. salt
1 tbsp. gelatin	⅛ tsp. pepper

Method.—Soak the gelatin in ⅛ c. cold chicken broth 10 minutes. Heat the remainder of the broth to boiling point, then pour on the softened gelatin. Cut the lean meat of chicken up into small pieces,

and stir into the hot broth. Add the salt and pepper. When nearly cold and it begins to thicken, fold in the whipped cream. Put in a mold, cover, and pack in ice, and let stand to harden.

To serve, turn out of the mold on a platter and garnish with parsley. When served at table, slice off into ⅛-inch slices, and add a serving of hot mushroom sauce or mayonnaise dressing at the side of each slice of mousse.

MEAL PLANNING

Group 4 serve a dinner, using roast chicken with sweet potatoes, and a cold dessert. Fill in the rest of the menu as desired.

HOME PROJECTS

1. Cook chicken either by frying or roasting for one dinner during the week.
2. Plan a complete dinner and do all the marketing for it.

LESSON 60

PASTRY

Two-Crust—Fruit Pies

Pastry is mostly flour and fat. It is hard to digest even at its best, and whenever served should be light, flaky, and tender. The lightness of pastry depends on the air enclosed in it; its flakiness, upon the kind and amount of shortening and the method of mixing.

Essentials of Good Pastry.—*Good shortening.* Lard, lard substitute, butter, vegetable fats and oils, or a combination of butter and beef drippings are suitable.

When vegetable oils are used, less ice water is used. The oil acts as part liquid. If oil is substituted for solid fat in the rule for pastry, use ¼ cupful of oil to 1 cupful of flour. Less oil is required than solid fat.

Use only enough ice water to blend ingredients.

It is important that the ingredients be mixed cold. The fat should not melt till the baking process begins.

Pastry flour, which has more starch and makes a drier and more tender crust than bread flour.

Salt, to flavor.

Baking powder, to make the pastry lighter.

Tough pastry is caused by—

Too little fat in proportion to flour.

Too much water and flour.

Too much handling or rolling.

Too slow an oven in baking.

Proportions of Ingredients.—Use ¼ to ⅓ as much shortening as flour. Use enough ice water to make a stiff dough.

Pies are made with either 1 or 2 crusts. Two crusts are used for mince, fruit, and berry pies.

General Methods of Making Pastry.—*Method 1.*—Put the salt and baking powder into the flour and cut the short-

ening in with two knives or rub it in with the tips of the fingers, if the hands are not too warm. Heat softens the fat and makes a tough crust. Pastry must be handled as little as possible.

When the mixture is fine and creamy and looks like meal, add enough water to form a dough. Use the knife to combine the ingredients. Be careful not to make the dough wet.

Turn the dough out upon a floured board, and pat and roll with the knife into a ball. With a slightly floured rolling pin roll the dough lightly until about $\frac{1}{8}$ inch thick and a little larger than the pie tin.

Method 2.—Another method of adding the shortening is as follows: Work in half of the shortening as described above, and roll out the dough to the thickness of half an inch; then put in the rest of the shortening, in small pieces, around on top of the dough. Fold up each side of the dough to the center, with the shortening inside, and roll out to fit the tin. This method makes a more flaky crust than the first method.

To Put Crust in the Tins.—Lift the crust on the rolling-pin and lower over the pie tin. Be sure the dough is large enough all around. Fit the dough to the pan gently, so that no air bubbles form underneath the crust next to the pan.

Cut off the crust to fit the pan. To do so, hold the pie in the left hand and a knife in the right. Slant the knife with the point away from the body, and cut along the edge of the tin.

To Put Crusts Together.—Put the filling in the lower crust. When ready for the upper crust, dip the fingers in cold water and wet the edge of the lower crust.

Make slight openings in the upper crust to let the steam out of the pie when baking. Lift the crust on the rolling pin and lower upon the pie; fit down, and cut off even.

With a fork or with the fingers press the edges of the two

crusts together to hold in the juice of the pie. Do not press so hard that the crust will bake to the pan.

Time for Baking Pies.—*Two-crust,* fruit and berry pies require 40 to 45 minutes in a hot oven, 400°-450° F.

QUESTIONS AND PROBLEMS

1. How does the temperature for baking pastry compare with that for muffins? With that for plain cake?
2. How is the fat added to the flour for plain pastry?
3. What difference does handling pastry make in the texture of pies?
4. What difference would much flour on the board make?
5. In making a two-crust pie why is the lower crust moistened before putting on the upper crust?
6. Why is pastry difficult to digest?
7. Should little children eat pie?
8. Should school boys and girls eat pie at noon for their lunch?
9. Are pies purchased at corner stores as flaky and tender as those made at home?
10. Is there a difference in pastry when fresh or two days old?
11. When is the best time to bake pies, on Saturday for Monday serving, Monday morning, or just before serving?

APPLICATION (Two-crust pies)

Demonstrate cutting in the shortening and rolling out pastry according to Method 1.

1. Plain Pastry

⅓ c. shortening — ½ tsp. salt
1 c. pastry flour — ¼ tsp. baking powder
Ice water ⅛ to ¼ c., or enough to moisten dough

Method.—Have all materials cold, mix and sift the flour, salt, and baking powder, cut in the shortening with knives until fine like meal. Add enough ice water to make a stiff dough. Be careful not to make the dough sticky. Take on a slightly floured board and roll lightly to ¼ inch thickness. It improves pastry to stand on ice before rolling. Bake in a very hot oven. Makes 2 crusts for large pie.

(*Basis for 2 girls, one small pie, ½ rule.*)

2. A Richer Pastry (Method 2)

1½ c. flour — ⅛ to ½ c. shortening (butter)
½ tsp. salt — ¼ tsp. baking powder
Ice water to make a stiff dough

Method.—Mix and sift dry ingredients; rub in half the shortening, as in Method 2; add the ice water, and roll out the dough on a floured board. Put remaining butter on top in small pieces. Fold pastry or roll up and divide in two parts, if two crusts are needed. Roll out each crust separately. Makes 2 crusts.

Puff Paste used for patty shells is made by this method. One half as much shortening as flour is used and the fat is divided into three parts, each added separately. The dough is folded and chilled after each addition.

The pastry is then cut with a large cookie cutter into circles and half of them are cut again with a smaller cutter to remove the centers, Each ring is put on top of a large circle and baked. The shells are used for creamed chicken, peas, etc.

3. Apple Pie

4 or 5 sour apples
½ c. sugar
1 tsp. lemon juice
¼ tsp. cinnamon or nutmeg
1 tsp. butter
2 tbsp. water
⅛ tsp. salt

Method.—Wash, pare, and slice the apples. Line the pie plate with pastry and fill with sliced apples. Mix the sugar, salt, and spices and sprinkle over the apples. Add the lemon juice, butter, and water. Use more or less water according to the kind of apples used. Place on the upper crust. Bake in a hot oven 40 or 45 minutes or until the apples are well cooked.

(*Basis for 2 girls, ¼ rule.*)

4. Berry or Cherry Pie

1½ c. berries or cherries
½-¾ c. sugar
⅛ tsp. salt
1 tbsp. flour

Method.—Line a deep pie tin with plain paste, sprinkle over the bottom 2 tsp. of sugar and a little flour, add the fruit, which has been washed and picked over. Cover with sugar, add salt, and dredge with flour. Fruit may be cooked before adding to the pie crust, if preferred. Place on upper crust, and bake 40 to 50 minutes in a hot oven.

5. Mock Cherry Pie

1½ c. cranberries
1 tsp. butter
⅛ c. water
½ c. seeded raisins
1 c. sugar
1 tbsp. flour
1 tsp. almond extract

Method.—Line the pie tin with plain paste, put in the cranberries. which have been thoroughly washed and cut in halves. Add the washed raisins and then the sugar, water, and almond extract. Dredge

with flour, place bits of butter on top, and put on the upper crust. Bake 40 to 45 minutes in a hot oven.

6. Rhubarb Pie

1½ c. rhubarb	⅛ c. brown sugar
½ c. raisins	2 tbsp. flour
1 tsp. butter	

Method.—Wash and cut up the stalks of young rhubarb, but do not peel. Line a pie tin with plain paste and fill with the rhubarb. Wash the raisins and add to the pie, cover with brown sugar, dredge with flour, add bits of butter on top, and put on the upper crust. Bake 40 to 45 minutes in a hot oven.

MEAL PLANNING

Group 5 serve a type-3 dinner, using either roast beef or steak, with one vegetable besides potatoes, a salad with French dressing, and a two-crust pie for dessert.

HOME PROJECTS

1. Make a two-crust pie for dinner, using a large tin.
2. Assume the responsibility of the baking of the pie as well as the making.

LESSON 61

PASTRY

One-Crust—Custard Pies

One-crust pies are of two kinds: (1) those with only lower crust, or (2) those with only a top crust. The pies with the lower crust are used for cooked mixtures, custards, etc. A top-crust pie is used for very juicy fruits, usually berries, where the lower crust is apt to become soaked with juice.

For lower-crust pies the crust is much more crisp if baked first. To avoid the shrinking of the paste, bake the crust on the bottom of the inverted tin. Place on carefully, allowing the paste to come well down over the edge of the tin; trim off evenly, and fold pastry to make a rim. Prick the crust in several places before baking. When the crust is baked, in 5 or 6 minutes, slip it off the bottom of the plate to the inside, and fill. One-crust pies do not require as long a time for baking as two-crust pies.

If a single crust is to be baked in the tin, have the edge of the dough about 1 inch larger than the pan, and double under, to form an edge to the pie.

For upper-crust pies fill the fruit into the pan, add sugar to sweeten, and some flour to thicken the juice. Place a strip of pastry 1 inch wide around the top of the pan, moisten it, and apply the top crust as for a two-crust pie, and bake as a two-crust pie, 40 to 45 minutes.

Tins for Pies.—Perforated tin plates or glass baking dishes are best for baking pies. The under crust of pies is more thoroughly cooked and browned in these than when baked in earthen or granite pans. Never grease a pie tin, for pastry contains enough shortening to prevent the crust from adhering to the pan or dish. When glass baking dishes are used the pie may be served from them at table.

Food Value of Pastry.—Pastry is very hard to digest. The fat in pastry completely envelops the starch grains in the flour, preventing contact with water and with the digestive juices. Only tender, flaky pastry should be eaten, and that only by persons who are well and possessed of good digestion.

Serving Pastry.—For the home dinner, when pies are baked in the glass dishes, the serving of pie may be done at the table by the hostess. Place the pie in front of the hostess' cover at the top, the individual plates directly in front of the hostess. If a maid serves, she hands the plates one at a time to the hostess for serving, and places each plate as served before a guest. Individual pies are served on small plates from the kitchen. Hot pies are more difficult to serve than cold pies, and require considerable skill in serving. If the service of pies can not be accomplished well at the table, serve them in the kitchen before bringing to the dining room. Do not serve pies which are too hot to eat without cooling. A pie taken from the oven should stand about 10 minutes before serving.

QUESTIONS AND PROBLEMS

1. What is the advantage of baking the lower crust of pie first?
2. Why is it best baked on the inverted tin?
3. What is the oven temperature for pastry?
4. How should a two-crust apple pie bake?
5. Which costs less?
6. Why should the heat be reduced after the first few minutes of baking custard pies?
7. How long do meringues need to cook?
8. Could upper-crust pies be served easily at table?
9. What happens to meringue if it is cooked too long? Why?
10. What kind of menus are best when the dessert is a custard pie?

APPLICATION (Lower-crust pies)

1. Lemon Pie No. 1.

1 c. sugar	4 tbsp. lemon juice
2 eggs (yolks)	Grated rind 1 lemon
3 tbsp. cornstarch	1 tsp. butter

1 c. boiling water

Method.—Mix the sugar and cornstarch. Put in a double boiler, add boiling water, and stir constantly. Cook 2 minutes, and add the butter, beaten egg yolks, rind, and lemon juice. Bake a crust on the bottom of the pan, slip into the inside of the pan, fill with lemon mixture slightly cooled, and cover with meringue. Return to top grate of hot oven and brown meringue quickly.

Meringue

2 egg whites	½ tsp. lemon juice
2 tbsp. powdered sugar	¼ tsp. vanilla

Method.—Beat the whites until stiff, add the sugar gradually, and then the flavoring.

(*Basis for 2 girls, ½ rule.*)

2. Lemon Pie No. 2

1 c. sugar	Juice of 1 lemon
4 tbsp. water	Grated rind of 1 lemon
4 eggs	

Method.—Beat yolks, add sugar, and water. Cook in a double boiler until thick. Remove from the fire and add lemon juice. Fold in the stiffly beaten whites. Pile lightly in a baked lower crust. Put in oven and bake with moderate heat 15 minutes. Test as for custard.

VARIATIONS

Orange Pie. Use juice of 2 oranges and rind of 1 with 1 tsp. lemon juice in place of lemon in above rule.

Pineapple Pie. Use 3 tbsp. pineapple juice with 1 tsp. lemon juice in place of lemon in above rule.

3. Custard Pie No. 1

2 eggs	⅛ tsp. salt
¼ c. sugar	Nutmeg (grated)
2 c. milk	1 tsp. vanilla

Method.—Line a pie tin with pastry and make a good rim on the crust. Scald the milk and pour over the slightly beaten eggs; add the sugar and salt. Strain the mixture into the lower crust, and grate a little nutmeg over the top. Bake in a hot oven to cook the rim well; then reduce the heat and cook more slowly until custard is firm. Test with knife as with cup custard. Egg mixtures require a moderate oven.

(*Basis for 2 girls, ½ rule.*)

4. Custard Pie No. 2

Method.—Bake the lower crust separately. Cook the custard in a double boiler until thick, add flavoring, and spread custard evenly into

a baked crust. Then serve while warm. A meringue may be added as in lemon pie No. 1.

VARIATIONS

Cheap Custard Pie.—Use 1 tbsp. cornstarch, or 1 tbsp. flour in place of 1 egg in making the custard, and make same as cornstarch pudding.

Cream Pie.—Make same as Custard Pie, substituting cream for milk and omitting the nutmeg.

Chocolate Pie.—Add ¼ square Baker's chocolate after it is melted to the custard rule, and make either method 1 or 2.

Cocoanut Pie.—Add ½ cup of freshly grated cocoanut to cream pie, before baking.

Cream may be added in any of the variations, if a richer custard is desired, or cornstarch may be substituted, if a cheaper filling is wanted.

5. Pumpkin Pie

1½ c. cooked and strained pumpkin	⅔ c. brown sugar
½ tsp. ginger or nutmeg	1 tsp. salt
2 eggs	1 tsp. cinnamon
1½ c. milk	1 tsp. orange juice

Method.—Mix pumpkin, sugar, salt, and spices, add slightly beaten egg, and milk. Beat well; then add the orange juice. Fill the crust and bake. When a silver knife inserted in the pie will come from it clean, the pie is done.

6. Banana Pie

½ doz. bananas	½ tsp. salt
⅛ c. powdered sugar	1½ c. whipped cream

Method.—Bake single crust of pastry, fill with sliced bananas, add salt and powdered sugar. Cover with whipped cream just before serving. Red raspberries or strawberries may be used in place of bananas.

MEAL PLANNING

Group 6 plan a dinner, using broiled chops or breaded veal, with a one-crust pie for dessert. Make individual pies.

HOME PROJECTS

1. Bake a one-crust pie for one dinner, baking the crust first, and using a cooked filling.
2. Continue the meal cooking and serving work every day.

LESSON 62

FROZEN MIXTURES

Ices—Sherbets

Classes of Frozen Mixtures.—There are two general classes of frozen mixtures made in a freezer; namely, ices and ice creams. By varying the ingredients many different varieties may be produced in each class.

Ices are frozen mixtures of fruit juice, water, and sugar, with or without eggs. They are named from the kind of fruit juice used for flavoring. Ices include the following frozen mixtures:—

Water ice, which is made from fruit juice diluted with water, sweetened, and frozen quite firm. Water ice is served principally with the meat course at dinners.

Frappé is a water ice, half frozen and of granular consistency obtained by using an equal quantity of salt and ice in freezing.

Punch is a frappé with the addition of wines, fruit, or charged water.

Sherbet is made by adding either a little gelatin or the beaten whites of eggs to water ice. When eggs are used, they are added when the mixture is nearly frozen, and the freezing is continued until the mixture is firm and will hold its shape when served.

Milk sherbet is made by substituting milk for water in water ice. Care must be taken to thoroughly dissolve the sugar in the fruit juice before adding the milk, to prevent the mixture from curdling.

Sherbets are richer than water ices, and are served for desserts, like ice cream.

Ice Cream.—See next lesson.

The Freezing Mixture.—Ice and salt form a freezing mixture. The salt thaws the ice, consuming heat, and

makes a brine several degrees below the freezing point. This draws the heat from the contents of the metal can and causes the freezing. The smaller the pieces of ice and the more salt used, the more rapidly the mixture freezes. If too much salt is used, the frozen mixture has a coarse granular consistency, as in frappé. One part of salt to three parts of ice freezes a smooth, fine-grained cream mixture. Equal parts of salt and ice freeze sherbets and water ice to the right consistency.

Preparing the Ice.—Pound the ice in a burlap bag with a wooden mallet or an ax until it is in small pieces of about uniform size. Large pieces interfere with solid packing and the smooth turning of the freezer. Prepare enough ice to more than fill the freezer, and have plenty to pack the can in until time to serve.

Freezers are of two kinds: (1) those that require turning while freezing to revolve the can containing the mixture, and (2) those that need no turning while freezing.

The first type consists of a wooden bucket into which is set the metal can containing the mixture to be frozen. Space is left around the can in which to pack the ice and salt for freezing the mixture. The can is tightly covered and a crank attached to the top. A dasher inside the can is fastened to the top and rotates in one direction while the crank is turned and this turns the can in an opposite direction. This double motion, when slow, thoroughly blends the mixture while freezing, making a smooth evenly frozen product.

A satisfactory freezer is one that is strongly built, that turns easily, and that is free from rust. If a freezer is not accessible, one may be made from a tin can or pail together with a wooden bucket or tub for the cracked ice. Owing to the absence of a dasher the mixture freezes to the sides of the pail quickly and must be scraped down frequently to insure a more even consistency to the frozen mixture.

Type-II freezer is constructed of metal with an air space

formed by a double wall around the outside of the can. In the center of the freezer is the compartment for holding the liquid mixture to be frozen. Between this and the air space wall is a space in which the salt and ice are packed. The air space or vacuum prevents the outside heat from entering the freezing chamber or the cold from the ice from leaving it and helps to maintain a temperature below freezing which is produced by the action of the salt on the ice. Tight covers fitted with rubbers are fastened to both ends of the can, one for the opening of the inner chamber, the other for the ice compartment.

This freezer is a great time-saver, as a mixture to be frozen may be placed in the freezer and needs very little attention while freezing. This produces a very fine product when properly packed and directions for freezing are followed.

It formerly was thought necessary to keep the mixture in motion in order to produce a smooth fine-grained frozen product. It has been proved, however, that the texture is not so dependent upon the churning as it is upon the time spent in freezing and the quality of the mixture itself. If the mixture freezes slowly, it will be of smooth texture, while rapid freezing produces a coarse icy product.

General Direction for Freezing with Type I.—*Adjustment.*—Scald the can, cover, and dasher of the freezer thoroughly and then chill. Set the can in the tub part of the freezer and adjust the dasher. Pour the mixture into the can, filling it not over three fourths full, as a mixture expands in freezing. Cover the can and adjust the crank. Be sure that the can revolves with the crank.

Packing.—Fill the space around the can with alternate layers of ice and rock salt until the ice comes up nearly to the top of the can. Turn the crank occasionally to make sure the can turns and to pack the ice and salt closely.

Freezing.—Turn the crank of the freezer steadily and slowly, so as to expose as much surface to the cold as possi-

ble. If the ice melts rapidly, add more ice and salt to keep the bucket well filled above the height of the frozen mixture. The icy brine aids in the freezing and may be left in the freezer, unless it comes up so high that there is danger of its getting into the can. When the freezer turns very hard the mixture is sufficiently frozen.

Packing after Freezing.—After the mixture is frozen, draw off the water through a little hole in the side of the bucket. Wipe off the cover of the can to avoid getting any salt inside, and carefully and quickly remove the dasher. Scrape the cream down from the sides of the can and pack down well with a spoon. Put the cover on the can and fit a cork into the hole on top. Pack ice and salt around the can and on the top and throw a heavy piece of carpet or a blanket over it all to keep in the cold and exclude the heat. Frozen mixtures improve by standing at least an hour.

Directions for Using the Vacuum Freezer, or Type II.—Prepare the mixture to be frozen. Scald out the inner compartment of the freezer, then turn in cold water to thoroughly chill it. Prepare the ice very fine. Fill the cream mixture in the can about three fourths full. Put on the top with the rubber. See that the seal is perfectly tight. Turn the freezer over and pack the salt and ice in solidly using first ice then salt in layers according to the proportion of each to use. Use a large spoon to pack the ice in closely. When tightly packed and full, pour in one cupful of cold water, then put on the top and rubber securely. Let stand inverted, that is, with the ice side up. After twenty minutes turn the can over, open the inner container top, and with a large spoon quickly scrape down the mixture which has frozen around the side of the can. Again seal and invert the can. In another twenty minutes open and scrape down the mixture for the second time, then seal and invert the freezer and let stand until ready to serve. The scraping down of the mixture makes the frozen product of more uniform consistency.

Food Value.—All frozen products should be eaten slowly so as not to chill the digestive tract and interfere with the digestion of other foods.

Ices and sherbets made from fruit juices and water serve the same purpose as fruit juice or fruit beverage in the dietary.

Frozen mixtures containing milk, cream, eggs, gelatin, etc., have the same nutritive value as when used without freezing.

Use of Frozen Dishes.—Frozen dishes are for the most part highly nutritious, cooling, refreshing, and attractive desserts that may be used for luncheons, dinners, and afternoon or evening entertainments any time of the year. They are especially suitable during hot weather, and are of inestimable value for invalid diets.

Ices and sherbets make very pleasing accompaniments to the meat course with a dinner.

A sherbet makes a better dessert with a formal dinner consisting of many courses and many other foods than a rich ice cream and does not add materially to the number of Calories of the meal.

Ice cream is best to serve where the meal contains fewer foods and is used to increase the food value and number of Calories.

Serving.—Sherbets and ices should be served in glass sherbet dishes. The high-stemmed glasses makes the most attractive service. With the meat course at a dinner, the glass is placed at the top of the cover above the plate.

For the dessert or for an afternoon or evening party the sherbet glass is placed on a small attractive plate with a little linen or paper doily underneath. The individual cake may be placed on the plate at the side of the glass for the formal occasion. For the home dinner or informal party it is best to put the cake on separate plates or baskets and let each guest help himself when the cake is passed.

QUESTIONS AND PROBLEMS

1. Where are ices and sherbets used in the dinner menu?
2. Where would you use cranberry ice? orange milk sherbet? lemon or orange ice? strawberry sherbet?
3. What is the advantage of a vacuum freezer?
4. What proportions of ice and salt is used to freeze ices and sherbets? ice creams?
5. Why is water added to the top of the ice and salt mixture when it is first packed?
6. What is the principle of freezing with ice and salt?
7. Why should ice be broken in small pieces?
8. What precautions are necessary in packing the frozen mixture?
9. What kind of dishes are used to serve sherbets and ices?
10. How would they be served at table?

APPLICATION

1. Lemon Ice

4 c. water — 2 c. sugar — ¾ c. lemon juice

Method.—Boil sugar and water to a sirup (about 20 minutes), add lemon juice, cool, strain, and freeze.

2. Orange Ice

4 c. water
2 c. sugar
¼ c. lemon juice
Grated rind of 2 oranges
2 c. orange juice

Method.—Same as Lemon Ice; add fruit juice to sirup, cool, strain, and freeze.

3. Orange Milk Sherbet

4 oranges
4 lemons
4 c. sugar
4 pts. milk

Method.—Beat orange and lemon juice and sugar together until sugar is dissolved. Add the milk quickly and freeze at once.

(*Basis for class, full rule.*)

4. Three-of-a-Kind Sherbert

3 oranges
3 lemons
3 bananas
3 c. sugar
3 c. water
3 egg whites

Method.—Prepare juice from oranges and lemons, mash bananas, put all through a strainer, add the water and sugar, and stir constantly until dissolved. Put into freezer and freeze until the consistency of mush, then open the top carefully and quickly and stir in the egg whites beaten stiff. Repack and finish freezing.

(*Basis for class, full rule.*)

5. Sherbets (with gelatin)

1 tbsp. gelatin	½ c. boiling water
½ c. cold water	1 c sugar
Fruit juice	1 c. cold water

The fruit juice for this recipe may be any of the following:—

Juice 6 oranges	1 pt. fresh pineapple
Juice 6 lemons	1 pt. raspberry or strawberry
1 pt. cantaloupe pulp	1 pt. rhubarb pulp and juice

Method.—Soak the gelatin in ½ cup cold water 20 minutes. Add the boiling water, stirring until dissolved. Add the sugar and the rest of the cold water, together with the fruit juice to be used. Freeze as any other ice. The beaten whites of 3 eggs may be added when the mixture is partially frozen, as in rule No. 4.

MEAL PLANNING

Group 7 serve a dinner, using an ice or sherbet with the meat course.

HOME PROJECTS

1. Prepare an ice or sherbet at home during next week. See that the dietary plans for the children are measuring up to requirements.

2. Prepare some different vegetable or a common vegetable in a new way for next week.

LESSONS 63

FROZEN MIXTURES

Ice Creams

Ice creams are mixtures of cream, sugar, and flavoring, and frozen to a firm consistency in a freezer. Being composed mainly of cream, they are richer in nutrients than the ices. Ice creams are used extensively for desserts.

Classes.—Many variations of ice cream may be made from the same foundation, by simply varying the flavoring and by the addition of fruits or nuts. The foundations of all ice creams, however, are of two classs, as follows:—

1. Those made with all cream, sweetened and flavored.
2. Those made with a custard (milk, eggs) and cream, sweetened and flavored.

Ice creams made with custards are not as expensive or as rich in food value as those made of all cream, and are commonly spoken of as "plain ice cream."

Fruit ice cream is made by adding crushed and sweetened fruit to the foundation rule for ice cream. The amount of sugar to be used depends upon the acidity of the fruit.

Fruits best adapted to ice creams are pineapple, peach, apricot, strawberry, raspberry, cranberry, cherry, currant, and all candied fruits.

Nut ice creams are made by adding chopped nuts to an ice cream rule, and any of the following nuts may be used: walnuts, pecans, almonds, filberts, chestnuts, peanuts, and pistachio.

Cream.—The quality of cream depends to some extent upon the animal from which it is derived and the manner of feeding, but largely upon the care given the milk and cream. Separator cream may be kept longer, since it is taken from fresh milk, while cream formed by allowing the milk to stand is usually from 12 to 24 hours old.

Cream may be separated thick or thin, and for commercial purposes is designated as "thin" and "double" cream, according to its thickness. Thin cream, containing from 18 to 25 per cent fat, may be used for ice cream, with or without a custard foundation. Double cream, usually containing about 40 per cent fat, is very thick, and is best for whipping. If used for ice cream it must be greatly reduced by milk or the action of the freezer is likely to produce butter. Condensed milk is sometimes used for ice cream, but it must be reduced with water.

Custards are mixtures of milk, sugar, flavoring, and eggs. Flour or cornstarch may be substituted as thickening in place of eggs, but requires thorough cooking and does not make as rich a custard, or a teaspoonful of gelatin to each quart of milk may be used to make a smooth frozen product and reduce the number of eggs and the quantity of cream.

An ice cream with a custard foundation does not require as much cream as one without custard. Custards or any mixture that is frozen require about twice as much sugar to sweeten as those not frozen.

To make fancy shapes or bricks of ice cream, put the molds where they will get ice cold; then put in the ice cream by spoonfuls. Pack the mixture in solidly and fill the molds so full that when the cover is put on every part of the mold is filled. Two or more kinds of ice cream may be combined in one mold by packing them in layers. This makes what is called Neapolitan ice cream. A water ice may also be combined with ice cream in the same way. Cover the mold with oiled paper or wrap with cloth. Pack in salt and ice, using 1 part of salt to 4 parts of ice, and let stand an hour or two.

To remove ice cream from the mold, remove the mold from the packing, take off the cover, and let stand a minute or two. Run a knife around the inside of the mold, if it is

regular in shape, invert over a serving dish or platter, and the cream will slip out. If it does not come out easily, dip the mold into warm water and out at once or wipe it with a cloth wrung out of hot water.

Serving Ice Cream.—The large mold or a brick of ice cream may be served attractively at the table by the hostess. Use a pretty, large plate, a chop plate, or a silver platter and a silver pie knife for the purpose. The individual molds are served from the kitchen, also all bulk ice cream. Bulk ice cream may be served in tall sherbet glasses or on a dessert plate. Brick and fancy forms of ice cream are served on a plate with or without a small paper doily underneath.

QUESTIONS AND PROBLEMS

1. How do ice creams differ from sherbets?
2. How many classes of ice cream are there?
3. What kind of frozen mixtures are best for children?
4. What kind of cream is used for whipping?
5. What proportion of ice and salt is used for ice cream?
6. Name two other ways of varying the Standard rule for ice cream.

APPLICATION

1. Vanilla Ice Cream (Custard foundation)

2 c. scalded milk	1 egg
1 tsp. flour	⅛ tsp. salt
1 c. sugar	1 qt. thin cream
	2 tsp. vanilla

Method.—Mix flour, sugar, and salt, add the egg slightly beaten, and then the scalded milk gradually. Cook over hot water in a double boiler for 15 to 20 minutes, stirring constantly at first. Remove from the fire, cool, add the cream and flavoring, strain, and freeze. If custard has a curdled appearance it will disappear in the freezing.

Vanilla ice cream is the basis for various sundaes. Different crushed fruits, fruit sirups, or chopped nuts are used to cover and act as pleasing flavorings.

(*Basis for class, whole rule.*)

2. Vanilla Ice Cream

1 qt. thin cream	1 pinch of salt
1 c. sugar	1½ tsp. vanilla

Method.—Add the sugar, salt, and vanilla to the cream, and freeze.

VARIATIONS

Chocolate Ice Cream

Boil 4 oz. bitter chocolate and 1 c. water together 5 minutes, and add to vanilla ice cream just before freezing.

Coffee

Add 1 c. strong black coffee to vanilla rule before freezing.

Caramel Ice Cream

Add 1½ cupfuls of caramelized sugar. Then freeze.

To caramelize sugar, melt sugar in an omelet pan slowly, stirring constantly until melted and heated to a rich brown color. Then add slowly to hot custard.

3. Strawberry Ice Cream

3 pts. thin cream	2 c. sugar
2 boxes berries	Pinch of salt

Method.—Wash and hull the berries, cover with sugar, and let stand 2 hours. Mash, and press through a fine strainer, add the salt and cream, and freeze. Red raspberries may be substituted for strawberries.

MEAL PLANNING

Group 8 serve dinner using an ice cream for dessert.

HOME PROJECTS

1. Prepare ice cream during the week for some meal or party.
2. Figure out the cost of the ice cream and compare it with ice cream as purchased in the stores.

LESSON 64

FROZEN MIXTURES—(With Whipped Cream)

Charlottes—Parfaits—Mousse

Frozen Cream Mixtures or Puddings may be made with any ice cream rule by adding fruit, preserved or candied fruits, or macaroons, etc., together with flavoring, such as maraschino, and freezing the mixture the same as ice cream.

Frozen puddings are sometimes packed in ice and salt for several hours, and are frozen without stirring.

They may be made with a foundation of either eggs or gelatin and whipped cream.

Mousse is an example of this type and is made of the whip of heavy cream, sweetened, flavored, and packed in a mold in ice and salt (1 part salt, 2 parts ice) for 3 or 4 hours.

Parfait is made of cream, sugar, egg yolks, flavoring, with or without the addition of fruit or nuts. The mixture is packed in a mold and set in ice and salt for 2 or 3 hours. Owing to the presence of egg yolks, it does not require as long a time for freezing as mousse.

Frango is made like mousse, but frozen with a large per cent of salt (equal parts of salt and ice) which produces a shredded texture.

A charlotte is a combination of whipped cream and gelatin.

To Whip Cream.—Thoroughly chill the cream before whipping. Put cream into a deep bowl and set bowl in a pan of cracked ice. Add a little water to the ice,—it chills the cream more thoroughly. Dilute heavy, double cream about one third its bulk with milk; undiluted heavy cream will turn to butter if beaten a minute too long.

Use a rotary beater. Cover the top of the bowl with a paper to keep cream from spattering, making a hole in the center for the beater and weighting the corners of the paper

under the bowl. A cream whip or churn is suitable for beating *thin cream*. Thin cream especially should be cold, and, therefore, the cream or the churn should be set in cracked ice.

The first whip of cream which appears on the top is filled with large air bubbles, which break easily. This is not good to use. Stir it into the cream and continue beating. When the cream beats up thick, remove the top whip by spoonfuls as fast as it forms and put into a strainer over a bowl. The thin cream drains off and may be put back into the bowl to be whipped. The thick whip is ready for use. Continue until all the cream possible is thick. Cream about trebles its bulk in whipping.

Food Value.—*Frozen mixtures* containing cream, eggs, or gelatin contain much food value and are better served with the light meal than with a meal already rich in foodstuffs. When served, they should be counted as part of the fuel foods and the Calories furnished included in the total number served at that meal.

Packing Cream Mixtures for Freezing.—Put the prepared mixture in a wet mold and tightly cover. Seal the opening around the cover with an oiled paper or a strip of cloth stretched tightly around the mold to keep the salt and ice from entering the mold. Pack the mold in a large bucket containing ice and salt to completely cover the mold and deep enough to allow for the melting of the ice without exposing the mold to the air. Let stand 4 hours. For frozen puddings use 1 part salt to 2 parts of ice.

QUESTIONS AND PROBLEMS

1. What kind of cream is used for whipping?
2. How should cream be whipped?
3. How do charlottes differ from mousse?
4. What is the foundation for mousse?
5. How should mousse be packed?
6. What practical use do you make of your Domestic Science work?
7. What part of your course has been the most helpful?

APPLICATION

1. Charlotte Russe

1 tbsp. granulated gelatin	⅓ c. powdered sugar
¼ c. cold water	3½ c. thin cream whip
⅓ c. scalded cream	1½ tsp. vanilla

6 or 8 lady fingers

Method.—Soak gelatin in cold water, add scalded cream, stir until it dissolves, strain into a bowl, add the sugar and flavoring. Set the bowl in ice water, stir constantly until it begins to thicken; then fold in whip from cream, adding about one third at a time. Line a mold with lady fingers, placing on end side by side ½ inch apart with the crust side out. Pack the mold with the mixture, and chill. May be made in individual molds.

(*Basis for 2 girls, ⅓ rule.*)

2. Pineapple or Strawberry Charlottes

Method.—Pineapple and strawberry charlottes are made by adding 1 cupful of pineapple pulp and juice and grated rind of half a lemon, or 2 cups mashed strawberries and more sugar.

3. Maple Parfait

4 eggs	1 pt. cream
1 c. maple syrup	Pinch of salt

Method.—Cook egg yolks and sirup together 3 minutes and add salt. Cool the mixture. Beat the cream and add to the egg mixture. Add the stiffly beaten egg whites and pack in salt and ice for three hours.

4. Bavarian Cream (without custard foundation)

½ c. fruit juice	1 tsp. gelatin
½ c. lemon juice	1 tbsp. cold water
⅛ c. sugar	2 eggs

Method.—Mix the fruit juice, lemon juice, and sugar with the egg yolks. Put in a saucepan and cook over a slow fire, stirring constantly until the mixture thickens. Remove from fire, add the soaked gelatin, and pour the mixture over the whites of eggs beaten stiff. Set in a pan of ice and beat until the mixture holds its shape. Turn into one large mold and chill. Any fruit juice may be used.

5. Neapolitan Mousse

1 qt. cream	2 tbsp. granulated gelatin
½ c. maraschino sirup	4 tbsp. milk
½ c. candied fruit, cut fine	1 sc. c. powdered sugar

Method.—Whip the cream, drain in a strainer. Use only whip.

Soften the gelatin in the milk, dissolve by setting bowl in boiling water, strain into a bowl, add powdered sugar and flavoring. Fold in the whip from the cream carefully, add the candied fruit, cut fine and softened in the maraschino sirup. Pack closely in a wet mold, cover tight, bind with buttered cloth. Pack in ice 3 or 4 hours.

MEAL PLANNING

Group 9 serve a dinner using a frozen pudding for dessert. Or an afternoon party may be given using a frozen pudding as part of the refreshments. For easy service these may be frozen in individual molds. Use individual frosted cakes with it.

HOME PROJECTS

1. Prepare one of the rules for this lesson for the dessert for next Sunday's dinner.

2. Continue with your home work in Domestic Science every week and you will eventually become an accomplished, capable hostess and home maker.

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